UTAH DEPARTMENT OF TRANSPORTATION

INNOVATION & EFFICIENCIES REPORT 2017

UDOT
Keeping Utah Moving

TABLE OF CONTENTS

TAGS EFFICIENCY QUALITY INNOVATION SAFETY MOBILITY

CONNECTED VEHICLE

Implementation of DSRC technology is one of the first steps toward connected vehicle integration in the state!

THE PROBLEM:

Technology is changing the way we keep Utah moving and how we manage the reliability of our systems. Incorporating and testing new technology while providing a system that can assist with transit reliability was the goal of this project. Implementation of DSRC technology is one of the first steps toward connected vehicle integration in the state!

THE CHANGE:

UDOT & UTA identified Redwood Road from 400 S. to 8020 S. as a corridor with a transit reliability of 88% and high AADT. Dedicated short range communication (DSRC) devices were installed at 30 signalized intersections and in 4 buses on bus route 217. DSRC devices communicate with each other about real time traffic. If a bus is behind schedule it will request priority from the signal cabinet device. After considering certain factors of the other movements the signal device can extend the signal green time. The process of research and implementation began in 2015 and it became operational November 2017.

THE RESULT:

UDOT is collecting and analyzing data on how the system changes transit reliability and how it affects the vehicle traffic. DSRC technology allows UDOT to utilize the system for other applications preparing UDOT for the future vehicle. Some new vehicles have DSRC in them and are communicating with our devices now.

WHAT'S NEXT:

DSRC technology is being added to the Provo-Orem BRT project and will provide additional data to analyze the effectiveness of this type of system. To increase efficiency in providing safe roads for the traveling public UDOT is modifying the technology to provide snow plow priority.

For more information contact Technology & Innovation Engineer, Traffic Management Division

UDOT WIDE RISK ASSESSMENT LINK

Ongoing Departmental risk assessment clarifies and allows us to prioritize risk.

THE PROBLEM:

In 2016, The Office of the Legislator Auditor General conducted a comprehensive performance audit of the Department of Transportation. Performance audits help agencies, like UDOT, perform required functions more efficiently and effectively. Among the findings was the fact that UDOT did not have a risk based audit system in place as required by state statute. The audit noted that a risk-based audit plan allows UDOT to maximize the impact of limited resources.

THE CHANGE:

To address the finding, the Internal Audit Group first hired a performance auditor, Shane Young, to oversee the effort. Agency wide outreach addressed the following areas:

1 - Work with each group leader to identify concerns.
2 - Engage staff to identify concerns.
3 - Rank risks across the agency to quantify which are the highest priority.
4 - Develop a strategy to address the risk

THE RESULT:

A new policy was developed to create a systematic structure for identifying and addressing risk.This effort allows for increased transparency to the Transportation Commission, and results in a culture of risk-based thinking, better dialogue and prioritization of risk.

Other benefits include:
1- Getting a clear picture of what constitutes risk
2- Identification if strategic goals are implementable
3- Internal Audit group is more involved in the day to day activities of the Department, not just when money is involved, but in operations, process improvement, and input into decision making processes.

WHAT'S NEXT:

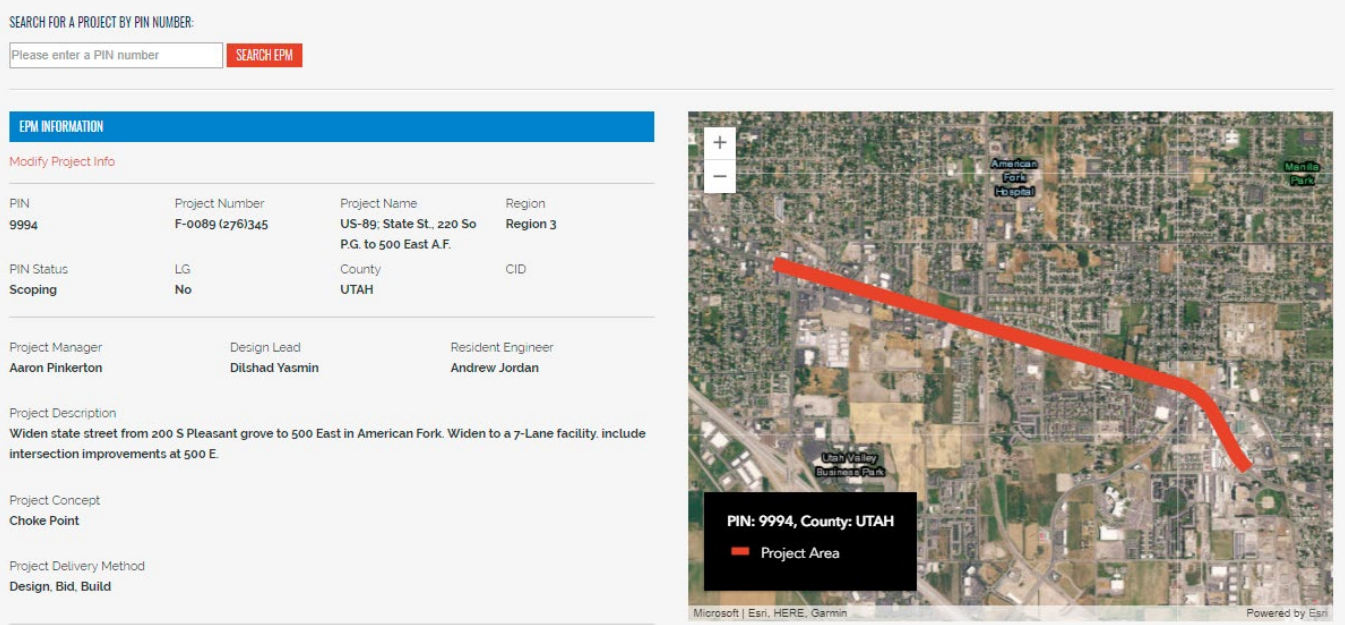
Outreach will continue annually with leadership and staff of the various groups. You can contact the Internal Audit group anytime (even anonymously) if you think there may be a new risk or if you have questions regarding risk.

ENTERPIRSE RISK MANAGEMENT PROCESS

ADDITIONAL LINKS:
Anonymous Internal Audit Contact Form | Internal Audit Website
Legislative Performance Audit of UDOT | UDOT 03-05: Enterprise Wide Risk Management Policy

For more information contact Preformance Audit Manager, Internal Audit

UTILITY COORDINATION LINK



Utility Tracking has been streamlined statewide.

THE PROBLEM:

Utilities are an important part of our business and they are everywhere. When UDOT begins designing a project we often have several utilities that require coordination. Statewide there was a need for a place/way for Utility Leaders/Coordinators to consistently track communication and information for utilities.

THE CHANGE:

A web based system using UDOT's Interchange was created generate and store letters, agreements, and communication, regarding utilities creating improved statewide consistency. The Region Utility leaders can now track the date, time and content of their communications with companies by project using the system. The system also stores agreements and tracks them from draft to execution.

THE RESULT:

The system is up and running and all the the Region Utility Leaders/ Coordinators have been trained. It is expected that the system will provide a process that is consistent statewide. The system will be key in managing legal issues that may arise if a utility issue has caused a project to push construction deadlines. By having documented communication UDOT is able to determine where the process is most time consuming, potentially reducing turnaround timeframes.

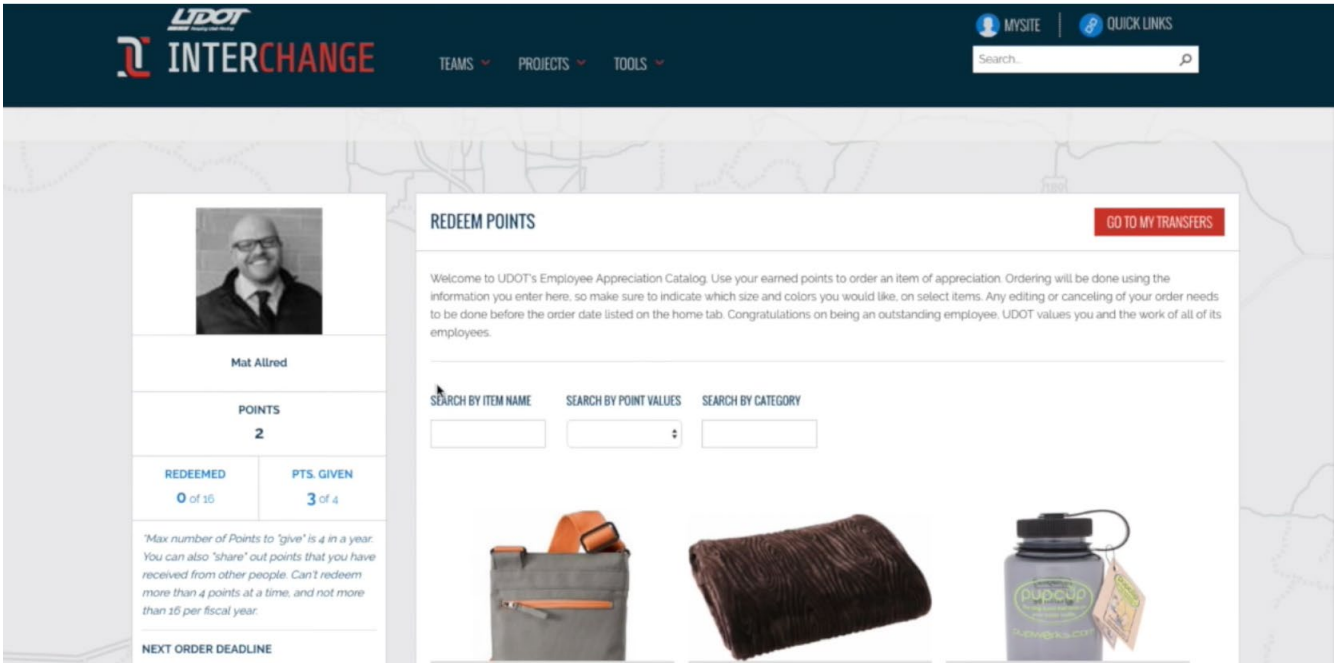
WHAT'S NEXT:

The system holds utility agreements and notice to proceed letters which also need to be uploaded Projectwise. To create efficiency, we are working on a way for the completed agreements and letters that are uploaded in the system to be automatically pushed to Projectwise with appropriate attributes. We are also working to include digital signature capabilities within the system.

ADDITIONAL LINKS:
Access Instructions for Utility Agreement Tracking Site

For more information contact Statewide Railroad & Utilities Director

EXTRA MILE LINK



The Extra Mile program is a peer to peer recognition system organized and maintained by employees.

THE PROBLEM:

UDOT employees asked leadership for a way to show appreciation to their fellow employees. The most common request was to do it in a way that provided the opportunity to earn UDOT logoed items. Similar programs in the past were discontinued due to perceived abuse and the amount of time and people it took to administer them. When reviewing these programs three needs were identified.

1- Require less time to manage it, any program would be an added duty to an existing FTE.
2- Follow policy regarding how and the amount of "extras" employees could receive annually.
3- A budget to be defined and controlled that is transparent and fiscally responsible.

THE CHANGE:

A group of Employee Advisory Committee members created a web based system that would allow employees to interact with each other statewide. This system was designed to be 100% paperless and track the points each employee earns, gives, shares, and redeems. To control the budget and follow policies on "extras" each employee is given 4 points to give out and are able to redeem up to 16 points each fiscal year.

THE RESULT:

Employees have given out 3,645 points and redeemed points for 347 items between September 2016 and November 2017. Creating the system has required minimal administration to manage the program and removed the burden of tracking the budget and amount each person is receiving.

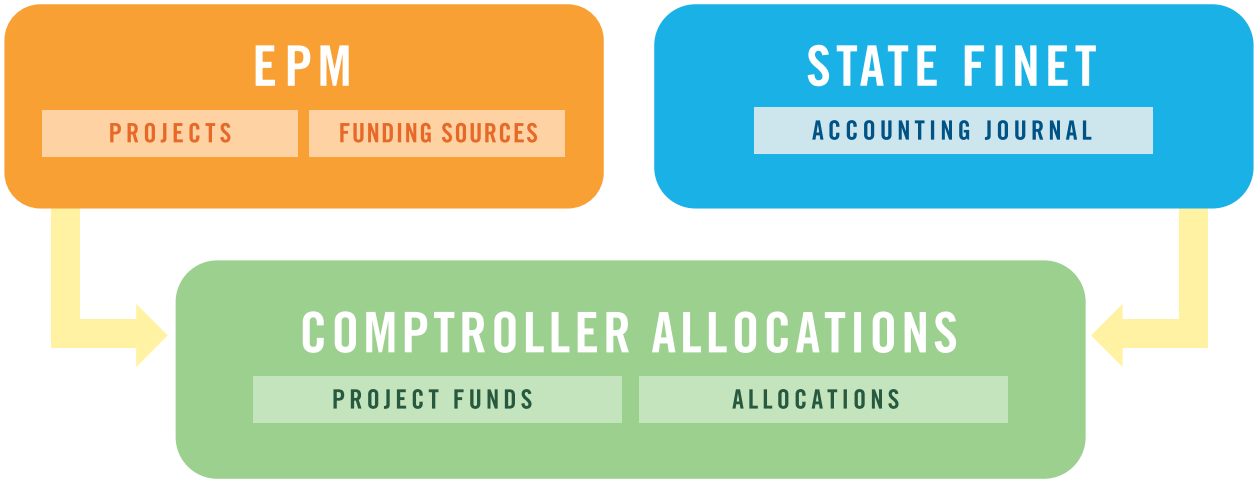
WHAT'S NEXT:

Starting in 2018 we will be adjusting the items in the catalog to represent the most ordered items and making the items relevant to our workforce. 2018 will be bringing an addition you won't want to miss!

ADDITIONAL LINKS:
Extra Mile Program - Redeeming Points

For more information contact Internal Communications Manager

TRANSPORTATION INVESTMENT FUND (TIF) MANAGEMENT



Tracking money (by source) through a project life cycle using project PIN's

THE PROBLEM:

Most UDOT projects today are blended with different funding sources (i.e. Federal, State, TIF). There was not an efficient way to track the color of state funding expended during the project life cycle. This was creating an issue with reprogramming unexpended funds on active projects and legislative reporting.

THE CHANGE:

The UDOT Comptroller's Office maintains an in-house Project Cost Allocation System. This system serves as a bridge between FINET and ePM to provide expenditure information by specific funding source for federal-aid and state projects. Improvements were made to the system reports to consolidate all the TIF related fund codes into one summarized and detail TIF report.

THE RESULT:

The report will quickly allow users to view how the TIF funds are being spent by PIN and project to date. In addition these reports will make it easier to prepare a monthly TIF draw and reimbursement of the Transportation Fund. The ability to provide detailed reporting to legislature of the status of our programming has increased transparency and is continuing to aide in building a culture of trust. This system is a critical financial tool for UDOT to report how funds UDOT is responsible for are being spent.

WHAT'S NEXT:

The system has provided us with many benefits and we will continue to monitor and improve it as new needs arise.

For more information contact Federal Aid Manager

PORT OF ENTRY TEAMS UP

LINK

Teamed up inspection approach reduces driver down time by half and increases accuracy.

THE PROBLEM:

Trucks that enter the Port Of Entry with visible violations or even at random are called in to do a level 1 inspection. These inspections include checking driver qualifications and hours of service plus all safety components on the vehicle. This process requires that a single inspector complete a physical vehicle inspection and then gather all required information. The information is then entered into a Federal database to check for any outstanding issues. This process on average takes 55 minute if violations are minimal.

THE CHANGE:

An inspector and a co-inspector will begin the inspection allowing one to do the vehicle inspection and one to gather and input paperwork into the database. A hand held radio is used to communicate between inspectors to relay pertinent information the other may need.

THE RESULT:

Splitting inspection duties between two inspectors has been a 25-30 minute savings per inspection. This allows for a faster turnaround of vehicles and less of a disruption to the carrier companies and drivers. We are also able to continue onto the next inspection quicker, reducing down time for those drivers who are waiting for an inspection. Working in teams has created a more unified and accurate inspection.

WHAT'S NEXT:

We are continuing to look for time saving ways to keep out trucking community on the road and moving safely.

For more information contact Director of Motor Carriers

RECESSED REFLECTIVE PAVEMENT MARKERS

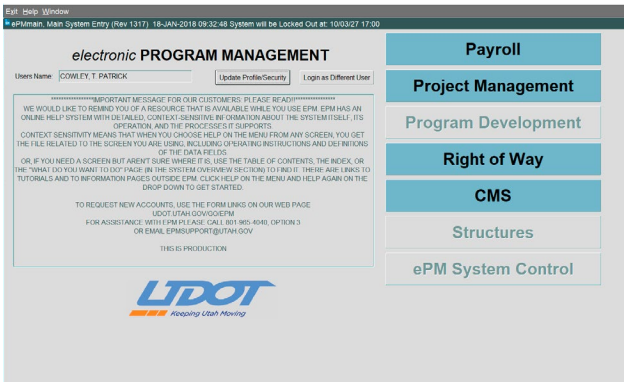
P During the winter pavement markings are difficult to see due to the accumulation of salt, water, and other debree on the road. Above surface markers are not a reasonable solution due to our plowing operations.

C UDOT adds reflective beads into the paint but this can still wear off. In three areas across the state we have installed recessed reflective plowable pavement markers.

R Prelim results look promising. It appears that the plowable markers may work.

For more information contact Maintenance Methods Engineers

ePM ONLINE HELP UPDATING & HOSTING IN SHAREPOINT



P The current ePM Help manual in RoboHelp was difficult to navigate and edits were not simple. Making the manual's usefullness limited.

C The ePM help manual which is hosted in Sharepoint, has made it much simpler to edit and is accessable directly from within ePM without a login to Sharepoint.

R ePM help manual is now more stable and easy to access. By not upgrading the RoboServer UDOT was able to save some money.

For more information contact Business Information Technology Group
LINK: HELP MANUAL

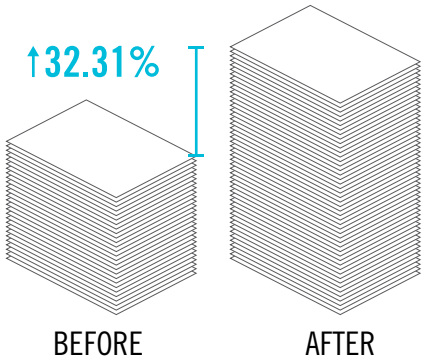
PROCUREMENT - QUALITY REQUISITION THROUGHPUT

P Incomplete requisition questions were leading to longer wait times for services and supplies.

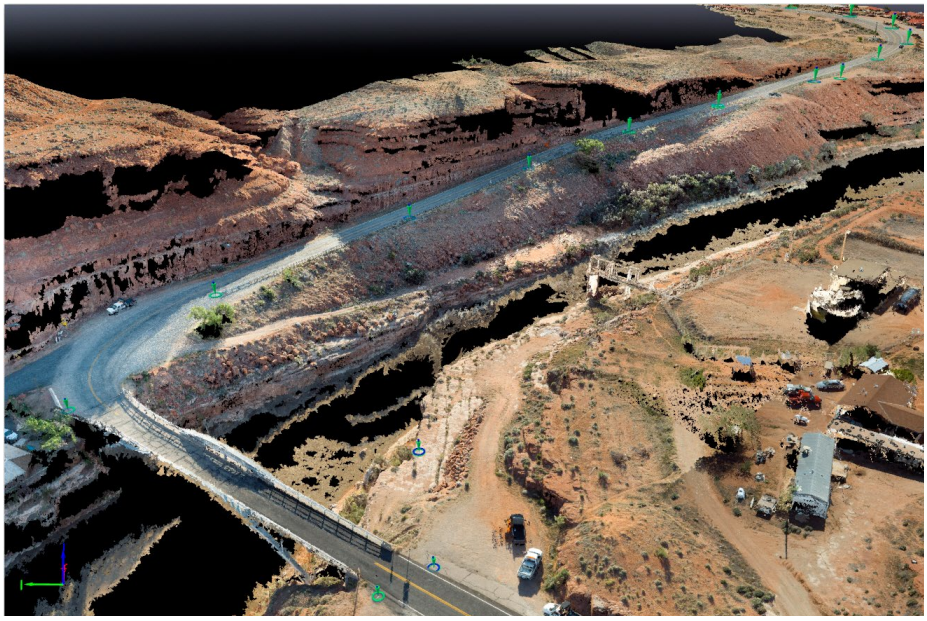
C The primary change was improving the training/ education of the process. By using flow charts, user guides, on-site region/division training, and online training.

R The increased training and education improved quality requisition throughput by 32.31% in FY2017 because of full kits from end users.

For more information contact Director Quality and Process Improvement



UNMANNED AERIAL SYSTEMS (UAS) E Q S



P There are some structures in Utah that have challenges when it comes to inspecting them.

C UAV's allow for safer inspections and solves some challenges.

R Achieved highly details surface point clouds with significant savings and improved safety over traditional methods.

For more information contact Central Pre-Construction Group

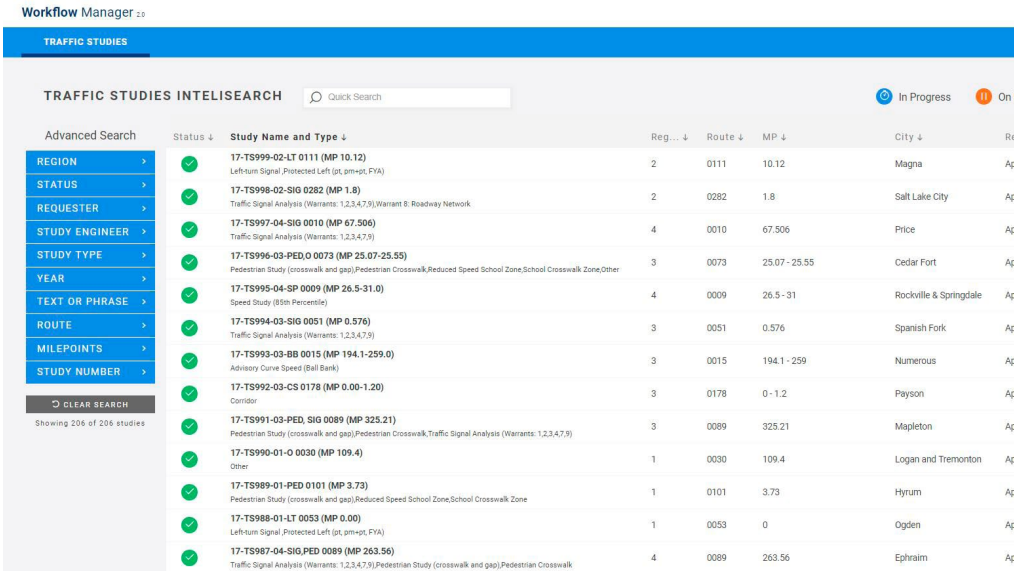
TRAFFIC STUDY PROCESS IMPROVMENTS & AUTOMATION E S

P Traffic study process is a highly manual process involving many emails and spreadsheets. Data can be difficult to process.

C Implemented a new Workflow Manager that is web based and tracks the internal processes making it easier to complete the traffic studies.

R Delivery duration has gone down substantialy with 97% of studies delivered on time.

For more information contact Traffic and Safety Division



RENEWABLE ENERGY: SOLAR CARPORT

P Desire within UDOT to pursue renewable engergy grant opportunities. Grant was pursued to install solar panels.

C UDOT has installed solar panels over the motorpool carports to benefit the UDOT Complex. The project addresses Air Quality, Electric Vehicle charging, and Environmental Stewardship.

R The solar panels are generating over 200 kilowatt hours during the day and additional work has been done to make installation in the future of the full build out much easier.

For more information contact Maintenance Methods Engineer

FLASHING WARNING SIGNS FOR TRUCKS ENTERING THE HIGHWAY

P Due to the limited sight distance and speed of traffic on SR-32, UDOT observed that it was difficult for large trucks to enter safely onto SR-32 from the Summit County landfill and Utelite Corporation.

C In coordination with Summit County Public Works and Utelite, UDOT installed driver feedback signs and solar radar warning signs to notify SR-32 traffic of oncoming cross truck traffic ahead.

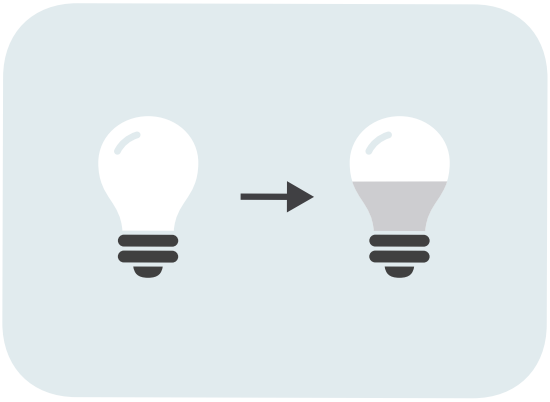
R Traffic on SR-32 now has advance warning of trucks entering the roadway on SR-32 around a blind curve, which has improved safety in this area.

For more information contact Station 2444

ENERGY EFFICIENCY: FACILITIES LED LIGHTING UPGRADE

- **P** UDOT Central Maintenance is working to take advantage of energy efficient efforts whenever possible.
- **C** Rocky Mountain Power energy efficiency incentive is allowing for replacedment of traditional light bulbs with LED bulbs.
- **R** Replaced lights have a lower operating costs, longer life, and will minimze maintenance over time.

For more information contact Maintenance Program & Contracts Manager



ePM WEBSITE UPDATE

- **P** Many links within the ePM website weren't being used and duplications were found in many areas.
- **C** Out of date links were removed and pages were arranged based on importance and number of time accessed.
- **R** It is now easier to find and access informated based off past ePM website usage.

For more information contact Contact Business Information Technology Group

FEDERAL PROJECT FUNDING REPORT

- **P** The FMIS funding report is lengthy and has significant amounts of data that require analysis by UDOT to be able to pull out the pertinent data needed by the UDOT Comptroller Office.
- **C** A report was created that builds in many calculations and logic verifying Federal Funding amounts and corresponding matches which has reduced the report by at least 75%.
- **R** The updated report has provided increased control in what is entered into FINET and ensuring acuracy of the data being utilized.

For more information contact Federal Aid Manager

STUDY THE PAST TO DEFINE THE FUTURE

- **P** Difficulty finding historical signal data.
- **C** Traffic and Safety gathered all existing as builts in electronic and hard copy format and uploaded them into a database.
- **R** Central database of traffic signal plans that is searchable and available to everyone.

For more information contact Central Traffic and Safety Division

LAB FINGER SAFETY

- **P** The field labs are cutting cores that are less than 1-inch, putting fingers very close to the saw blade.
- **C** A core clamp device was purchased to hold the HMA cores and reduce potential for injury from the blade.
- **R** A new saw was purchased accommodating the HMA cores and protecting individuals.

For more information contact Region Two Materials Lab

STRATEGIC FIBER HUB SWITCH UPGRADES

- **P** The ATMS network needed to have its bandwidth increased to accommodate new technology and growth. Also, IPv6 is required for connected vehicles, the network is not currently IPv6 compatible.
- **C** UDOT is in the process of upgrading all the backbone switches to 10G with one fiber connection.
- **R** Region 2 is now capable of 10G backbone connectivity.

For more information contact UDOT Fiber Optics Manager

2D LRS TO GIS/LRS

- **P** UDOT's 2D Linear Reference System (LRS) must be moved to a more robust GIS/LRS environment in order to represent the roadway data assets to FHWA.
- **C** Creation of GIS LRS.
- **R** Updated LRS will allow for an easier exchange of data between the UDOT Divisions and external groupings. It will make quality checking easier and more visual.

For more information contact Highway Performance Managment System Group (HPMS)

FEDERAL PROJECT FUNDING REPORT

- **P** The FMIS funding report is lengthy and has significant amounts of data that require analysis by UDOT to be able to pull out the pertinent data needed by the UDOT Comptroller Office.
- **C** A report was created that builds in many calculations and logic verifying Federal Funding amounts and corresponding matches which has reduced the report by at least 75%.
- **R** The updated report has provided increased control in what is entered into FINET and ensuring acuracy of the data being utilized.

For more information contact Federal Aid Manager

20.205
Highway Planning and Construction

Project Mgr	Brett Slater	Brett Slater	Brett Slater	Brett Slater	Brett Slater	Brett Slater
Project Number	F010482	F010482	F010482	F010482	F010482	F010482
Program Code	**Z230**	**Z230**	**Z230**	**Z230**	**Z230**	**Z230**
Project Prefix	L_BETTERME	L_CORR_WEB	LOCAL_GOVT	ST_CONT_R1	STP_URB_OL	ST_TIF
Percentage of Federal Share	93.23	93.23	93.23	93.23	93.23	93.23
Total Cost Amount	$512,600.00	$10,662.55	$6,800,000.00	$230,226.00	$7,070,034.00	$13,034,840.50
Federal Funds	$0.00	$0.00	$0.00	$0.00	$5,291,000.15	$0.00
State Funds	$0.00	$0.00	$0.00	$0.00	$478,641.30	$0.00
Local Funds	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Advance Construction	$0.00	$0.00	$0.00	$0.00	$1,300,392.55	$0.00
AC Funds Converted	$0.00	$0.00	$0.00	$0.00	$1,739,999.97	$0.00
Other Funds	$512,600.00	$10,662.55	$6,800,000.00	$230,226.00	$0.00	$13,034,840.50
Soft Match Amount	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Calculated Total Amount	$512,600.00	$10,662.55	$6,800,000.00	$230,226.00	$5,675,212.00	$13,034,840.50
Calculated State Amt	$0.00	$0.00	$0.00	$0.00	$384,211.85	$0.00
Calculated Local Amt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Phases	06K	07R	01D,15D, 07R, 10U	06K	06K	01D,03C,06K,10U,12S,13C,15D
FINET FUNDING LINE	10	10	10	10	10	8
Demo ID						
Right of Way Date						

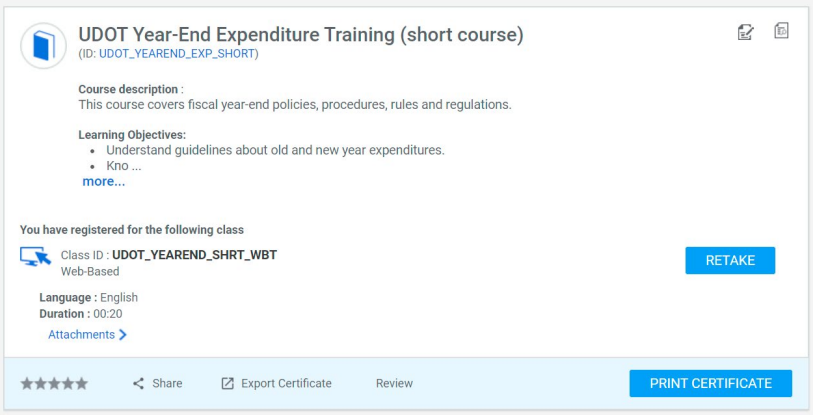
YEAR-END FINANCIAL TRAINING

P Confusion can exist regarding rules and regulations for purchases at fiscal year-end.

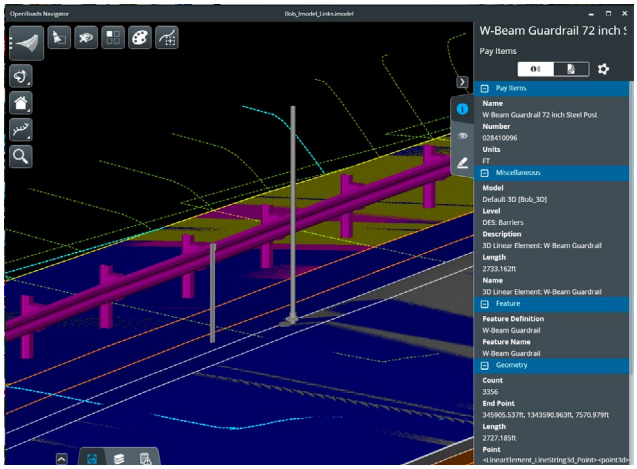
C All UDOT employees were requested to take online training to clarify the process.

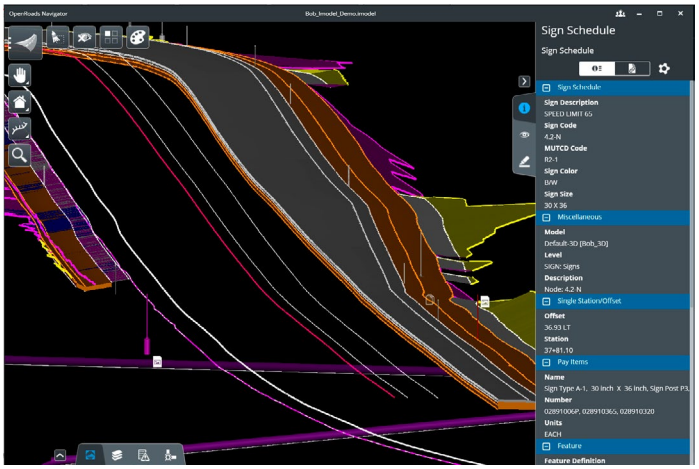
R Nearly 900 UDOT employees took part in the training which will assist with clarifying the current rules and regulations.

For more information contact Comptroller's Office



INTELLIGENT DESIGN AND CONSTRUCTION (IDC)





THE PROBLEM:

Projects are started with design 3D software, flattened to 2D plan sheets, then a time consuming recreation by contractors with construction 3D software; the contractor validates the construction 3D model with the paper (2D) plan set. This traditional practice created a sort of "telephone game" that cost both time and money to projects. Contractors need the information in 3D to effectively estimate and use automated machine guidance (AMG) systems on construction equipment. Many times the contractor could not validate the preconstruction survey which was to a lower quality than required and needed to be redone.

THE CHANGE:

The design group develops a 3D design and files which are provided to the contractor that can be imported into construction 3D software without the need to validate from plan sets. Recent improvements have resulted in files with built in attributes for each feature in lieu of side callouts. This eliminates the plan set rework required by the contractor. In addition, the upfront survey effort increased with preconstruction survey requiring a statistical analysis and Control Report in addition to setting a meeting with the survey company and the contractor. The Survey specification has been updated to loosen some tolerances and tighten others.

THE RESULT:

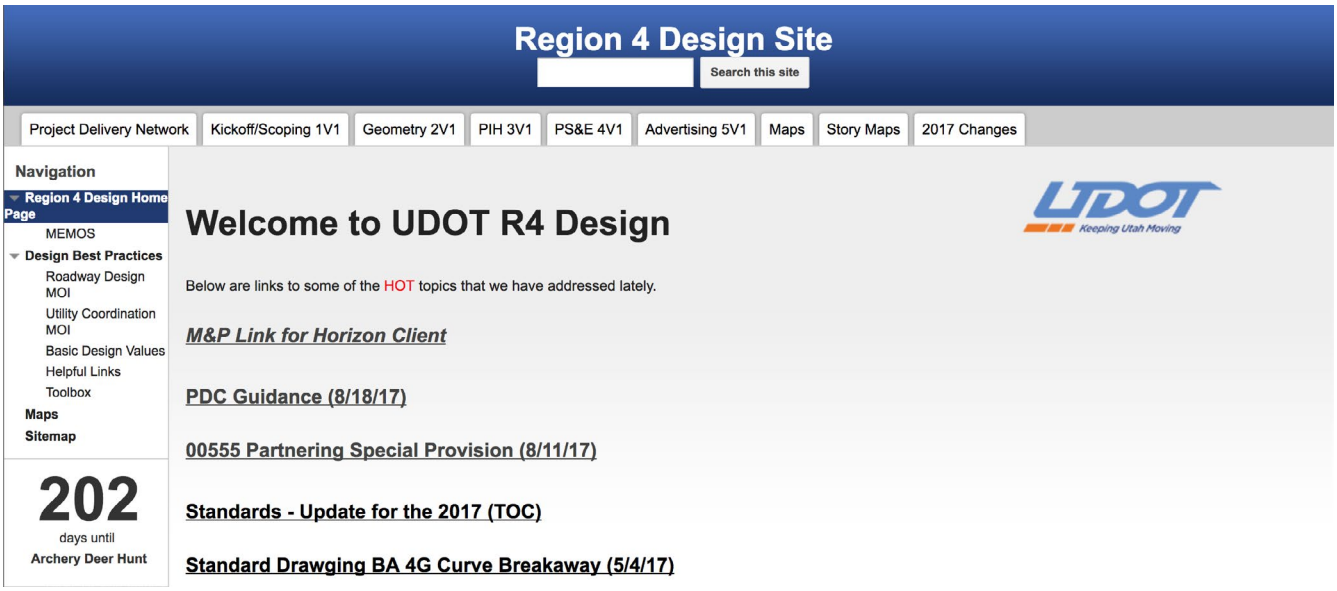
The changes have been used on seven projects thus far using both CMGC and DBB methods of contracting with more on the way. With each additional project, we are increasing the confidence level of the design staff and contractor to the accuracy of the survey and design files. Time savings have been realized along with greater quality design documents and project construction. Anecdotally, one project reported the time for the contractor to recreate the model from an estimated 21 days to just 3.

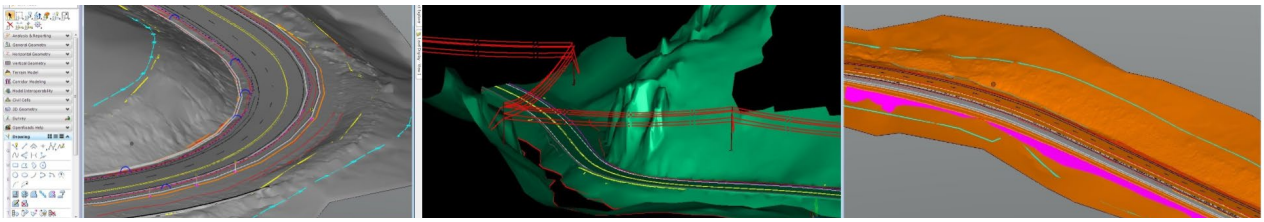
WHAT'S NEXT:

Being able to break down the design documents into role based filtering (i.e. estimator, contractor/AMG, subcontractor, designer) will allow for greater customization and efficiencies. Survey rovers that do not require technical personnel to operate to compare points to the model will dramatically increase time savings. Additionally, an IDC manual and life-cycle cost analysis are planned to document the process. The ultimate goal is to eliminate plan sheets and make this process the standard.

For more information contact Statewide Standards Engineer

REGION 4 DESIGN GOOGLE WEBSITE LINK





THE PROBLEM:

Region 4 Design sends an increasing number of projects out to consultants. There was a need for consistency in the design process and where to go to get the most up to date documents. In addition there was a lack of structured training for newer Region 4 Design engineers. Many questions about the process would come in from consultants taking time away from design production.

THE CHANGE:

Tracy Munson and Sam Grimshaw led the effort to develop a website on the google site platform to outline the design process complete with links, tutorials, and information. Tracy is responsible for updating the content and keeping the site current.

THE RESULT:

The website has helped improve the quality of design packages both from UDOT designers and from our consultant partners. In addition, less phone calls are coming in as the designers know to go to the website first before reaching out with questions. Often the answers are just a click away. The designers are now more efficient and the design packages more consistent in quality and delivery. Also, each Region 4 designer has their own page that is used as a sandbox for innovation. If something proves useful, it can be added to the main website.

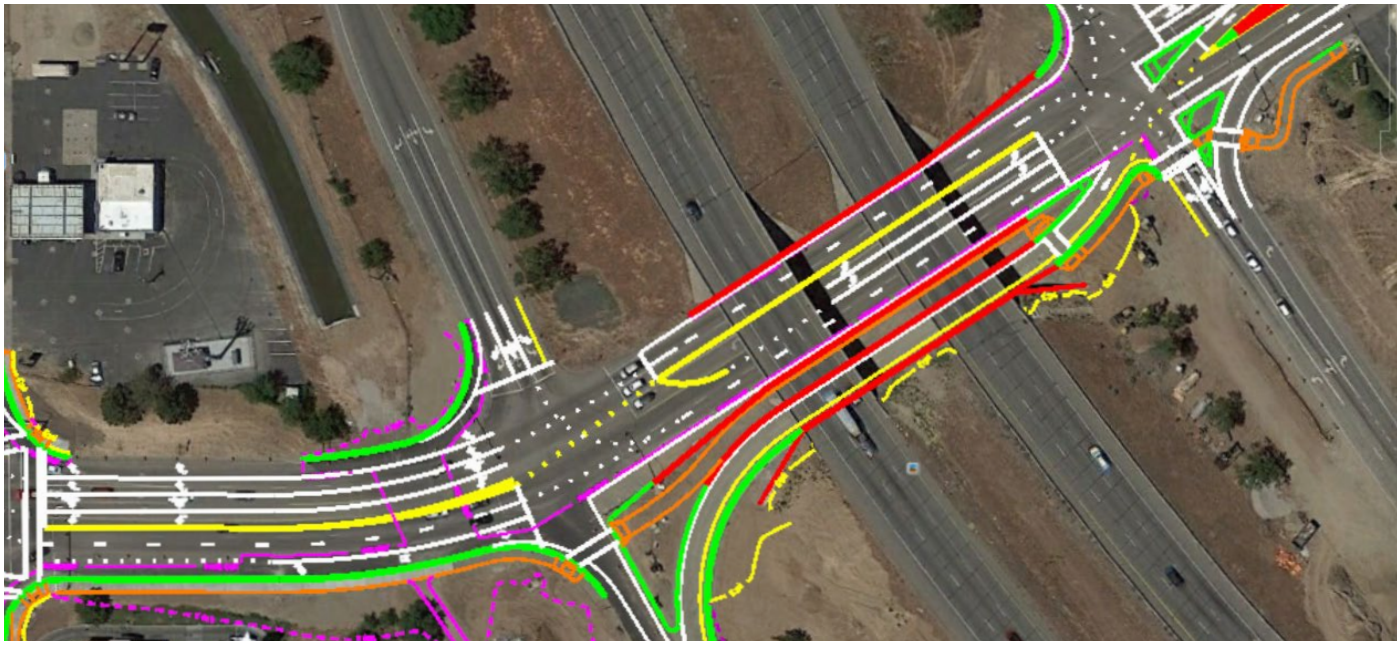
WHAT'S NEXT:

Websites like this are also in other Regions and Divisions throughout UDOT. Having useful and timely information within a few clicks has proven a great benefit. As similar websites are developed and shared, we gain a consistency and efficiency from the experience and efforts of others.

For more information contact Region 4 Senior Roadway Design Engineer

650 NORTH & I-15 INTERCHANGE/ INTERSECTION

LINK



THE PROBLEM:

650 North is the main West Gate into the Air Force Base and experiences significant traffic volumes from shift changes at Hill Field. This led to the interchange at 650 North to experience major congestion. Heavy congestion in all directions and Main Street (SR-126) being in close proximity to the interchange limited the amount of vehicle storage available, thus causing traffic to back up onto I-15 during peak traffic.

THE CHANGE:

Innovative design enhancements improved traffic flow and reduced accident potential on the freeway ramps, 650 N, and the 650 N and Main St. intersection. Improvements included a new dedicated left-turn lane for traffic exiting the Hill Air force Base West Gate to access the southbound I-15 on-ramp. The project also restriped 650 N. and Main St. intersection to include dual right-turn lanes from westbound 650 N. to northbound Main Street and dual left turn lanes from southbound Main Street to the I-15 on-ramps.

THE RESULT:

The improvements added 35 seconds of green time to the through movements by changing the signal from a 3-phase to a 2-phase. The enhancements also eliminated the backing onto I-15, allowing traffic to flow more smoothly to reduce congestion. Using much of the existing infrastructure, the project only cost $4M and was initially thought to be a “short-term fix.” With the efficiency of the interchange and other improvements in the area, this solution may last until 2040.

WHAT’S NEXT:

This successful application of innovative intersections allows for another example to draw on as we look for site-specific solutions that respond to problem areas.

For more information contact Region One Project Management

STREAMLINE THE PROJECT RE-ADVERTISE PROCESS

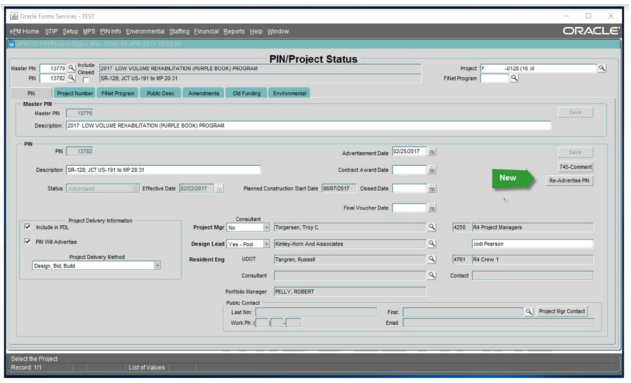
E Q

P Project re-advertisement process was a manual process that led to mistakes and delays.

C Button added in ePM allowing an individual to initiate the re-advertisement process and automatically advances the process.

R Will make things smoother for projects needing to readvertise.

For more information contact Business Analyst Supervisor



STREAMLINED SURPLUS PROPERTY PROCESS

E Q

P UDOT property surplus can be a lengthy and complex process.

C Identified areas of the process typically requiring rework and engaging at the beginning instead of the end.

R Analysis of critical elements tied to the sale of property led to more efficient scheduling tool and process within the Region.

For more information contact Region Three Preconstruction

3D VISUALIZATION OF ROADWAY DESIGN

E Q

P Reviewing the plans in 2D has inherent problems. It is difficult to see how elements interact with one another and issues may be missed.

C Using Bentley Power InRoads designers and reviewers are able to take a virtual walk through the project in 3D.

R Increased ability to spot issues and conflicts in design has made for higher quality advertising documents, reducing errors and misinterpretations in construction.

For more information contact Region Two Preconstruction

SAFETY-OPERATIONS QUARTERLY FIELD VISITS

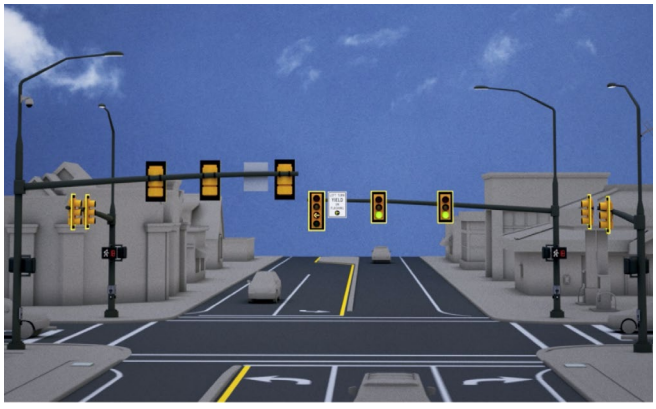
E Q S

P Incorporating more efficient approaches to traffic movements while not compromising safety can sometimes be a challenge.

C The multi-disciplinary team has been able to provide unique solutions that are solving problems in cost-effective ways.

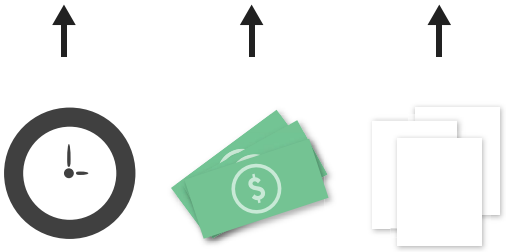
R Several changes have been made resulting in additional safety with only minor impacts to efficiency.

For more information contact Traffic Signal Operations Engineer or Traffic Management Division



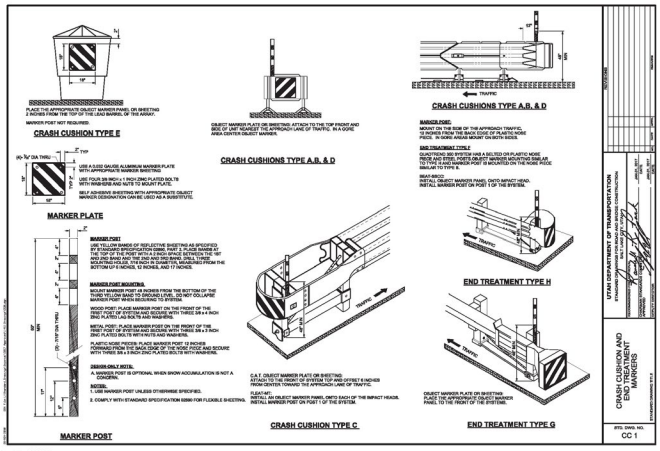
SPECIFICATION BOOK SIMPLICITY (E)

- (P) Specification Book table of contents was repetitive and very time consuming for designers to utilize for project advertisements.
- (C) Two TOC documents were created: Base and Project Specific. Links were also provided for the Standard and Supplemental Specs.
- (R) The project specification book shrank by more than half the number of pages per project saving time, money, and paper.



For more information contact Region 4 Materials Group

2017 UDOT STANDARDS REVISIONS (E) (Q)



- (P) UDOT's Standards Specifictions and Drawings need periodic updating to include the most current data.
- (C) Every 4-5 years UDOT takes on the challenging task of reviewing all of its Standards Specifications & Drawings, making the necessary revisions to bring them up to date with current state of the art practices, industry standards, and compliant with all state and federal regulations.
- (R) UDOT's Standards Specifications and Drawings are able to be kept current due to this periodic updating. This helps to not allow the Standards to become out dated.

For more information contact State Construction Engineer

PREEMPTING TRAFFIC SIGNALS NEAR RAILROAD CROSSINGS (S)

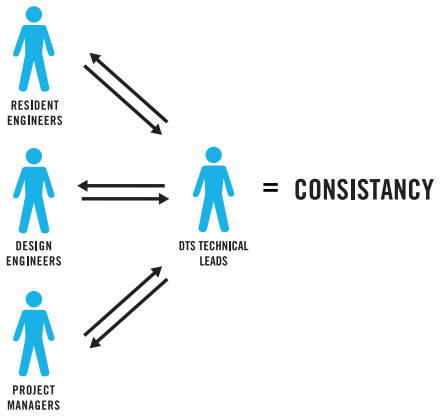
- (P) Limited standard guidelines regarding traffic signals near railroad crossings.
- (C) UDOT held a collaborative effort with UTA, UPR, and other railroads, cities, and counties to create the first formal statewide guideline and an associated interactive preemption calculation form.
- (R) Improved communication and further defined process, netting a cost-effective statewide program and the ability to develop innovative solutions that improve traffic mobility and ultimately save lives.

For more information contact Cheif Railroad Engineer

SYNCHRONIZING PROJECT ASSIGNMENTS THROUGH MULTIPLE SYSTEMS

- **P** Project assignments (Project Managers, Design Enginers, and Resident Engineers) were entered and maintainted in multiple systems in UDOT leading to inconsistencieis and concerns with data being up to date.
- **C** Collaboration with DTS technical leads in each areas has led to consistency.
- **R** The project assignment information is consistent throughout UDOT's systems.

For more information contact Business Analyst Supervisor



INVOICE REVIEW REFORM

- **P** High amounts of employment changes within UDOT and Consultanting firms has led to increased invoice rejections and rework.
- **C** Invoice training was developed and provided across UDOT and to the consulting community.
- **R** Increased understanding across UDOT and a decrease in rejected invoices leading to faster turn times.

For more information contact Central Preconstruction

PROJECT CASH FLOWS

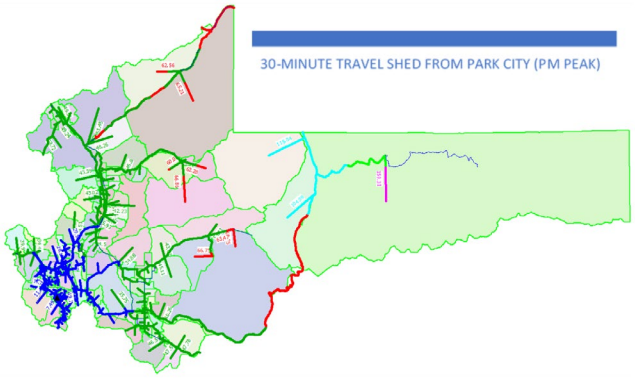
- **P** Need for a more accurate forecasting of future expenditures.
- **C** Expenditures are being reviewed on a quarterly basis and also projections for future spending. This is allowing for a greater accuracy of when future expenditures will take place and plan accordingly.
- **R** This has refined the planning process and has allowed the acceleration of some future projects. This has led to cost savings and quicker placing of assets on the roadways.

For more information contact Statewide Program Manager

SUMMIT COUNTY TRAVEL MODEL

- **P** Summit County approached UDOT to partner in developing a more localized travel demand forecasting tool that factored in some of the more unique elements of that County.
- **C** The architecture of the statewide travel demand model was redesigned to allow for a snap-in-snap-out of the Summit County area. Summit County and UDOT partnered to develop the tool that factored in some of the more unique elements of the County. Summit County now has a model that can be run independent of the rest of the state.
- **R** Summit County now has an independent, local travel demand model that they can use for their transportation planning that is consistent with statewide transportation planning efforts.

For more information contact Urban Planning Manager



PORTABLE VARIABLE SPEED LIMIT (PVSL)

Work zone speeds are being reduced.

THE PROBLEM:

When Utah raised the speed limits on many of its interstates from 70 to 80 mph the AGC and Utah construction crews raised the concern with the safety of workers, often working only a few feet from high speed traffic with only a barrel separating them. Construction zone speed reduction policies allow for a 10 mph speed reduction in work zones. A reduction to 70 mph (-10 from 80) left workers exposed to high speed traffic and an increased concern with safety.

THE CHANGE:

Recently UDOT incorporated the Variable Speed Limit (VSL) in Parleys Canyon. This application made it possible to use that technology and legislation to utilize a Portable VSL (PVSL) for construction zone speed management. UDOT purchased 11 PVSL units that radar real time traffic speeds and averages into 1 minute bins. The system will round down the average speed to the next 5 mph increment and then subtract an additional 5 mph, setting the speed limit uptp 10 mph less than the average speed. Application is limited to, rural two lane high speed (60+ mph) facilities and only placed in the active work zones where workers are on the road.

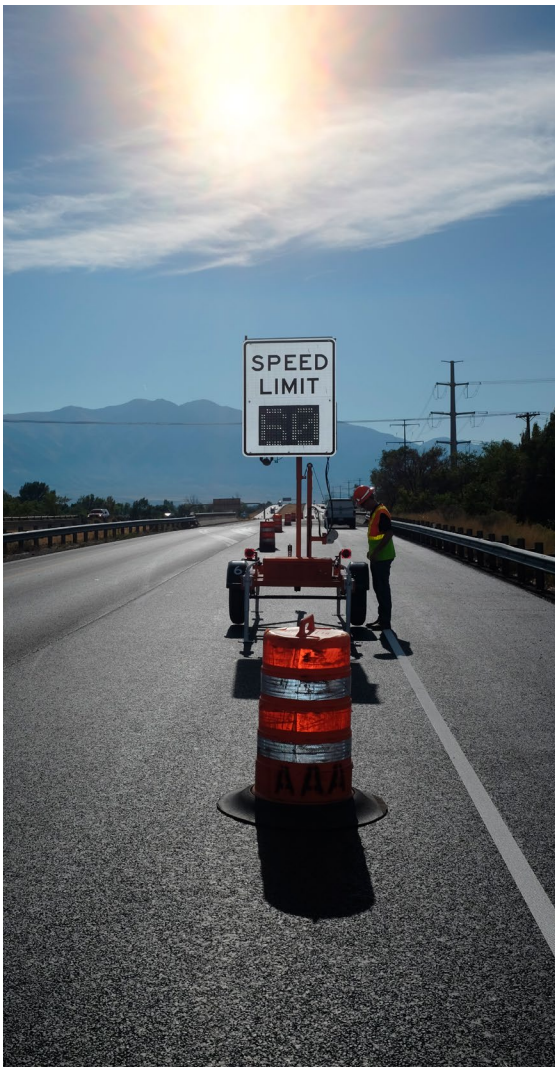
THE RESULT:

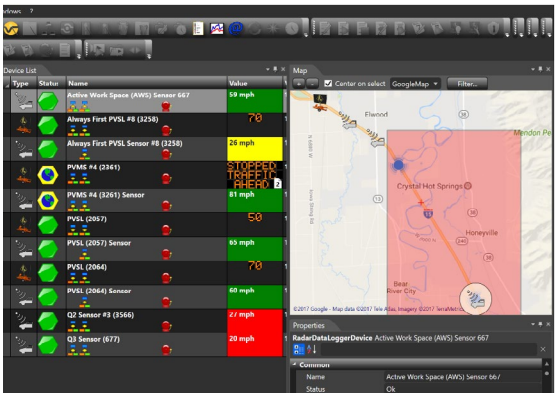
Deployment of the PVSL requires a Traffic Engineering Order (TEO) to make the speed limit legal. The individual units record their latitude and longitude and what the posted speed is at all times. The most common reduction has been 80 MPH to 50 MPH providing a much safer work environment. Using the system in shorter active work zones has provided better driver compliance.

WHAT'S NEXT:

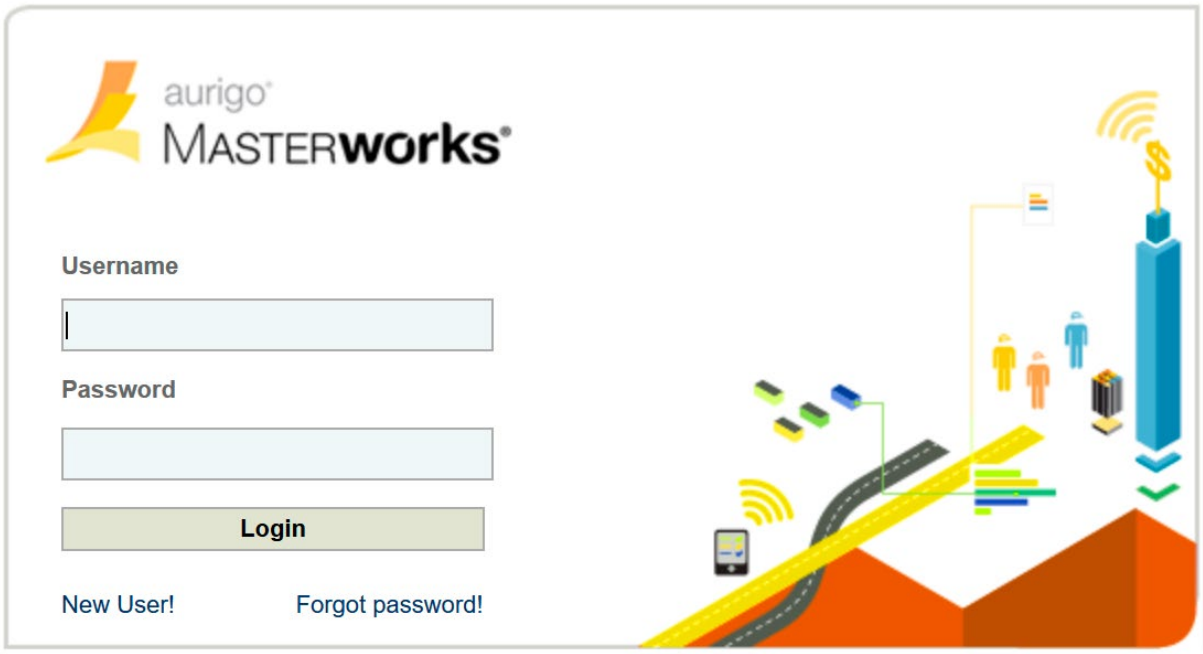
A performance based special specification is being written so that contractors can bid the system into 2018 construction projects. Four projects have used the system and have had success with speed harmonization and increased safety for all involved.

For more information contact Central Construction Group





MASTERWORKS: CONTRACT ADMINISTRATION LINK



MasterWorks replaced PDBS.

THE PROBLEM:

UDOT's internal project accounting system for construction projects,PDBS, has become a patchwork platform that is no longer meeting the current business needs of the construction crews. With no offline capabilities it often required double entry and lacked many features to stay abreast of today's fast paced construction projects. While it was a leader at its origination, sadly it was an old program that could no longer keep up with modern demands.

THE CHANGE:

UDOT contracted with Aurigo to implement its MasterWorks project accounting software to provide mobile operations and automated workflows for UDOT construction crews while integrating collaborative tools and payment systems to increase the speed of business for UDOT's construction projects (eConstruction). The off-the-shelf web-based program was configured for UDOT's needs and replaced PDBS with added functionality that included a mobile version (optimized for iPads), ability to work offline for inspector daily progress reports, quantity postings and RFI's; as well as the ability to electronically authorize change orders and pay estimates for both UDOT and Contractors.

THE RESULT:

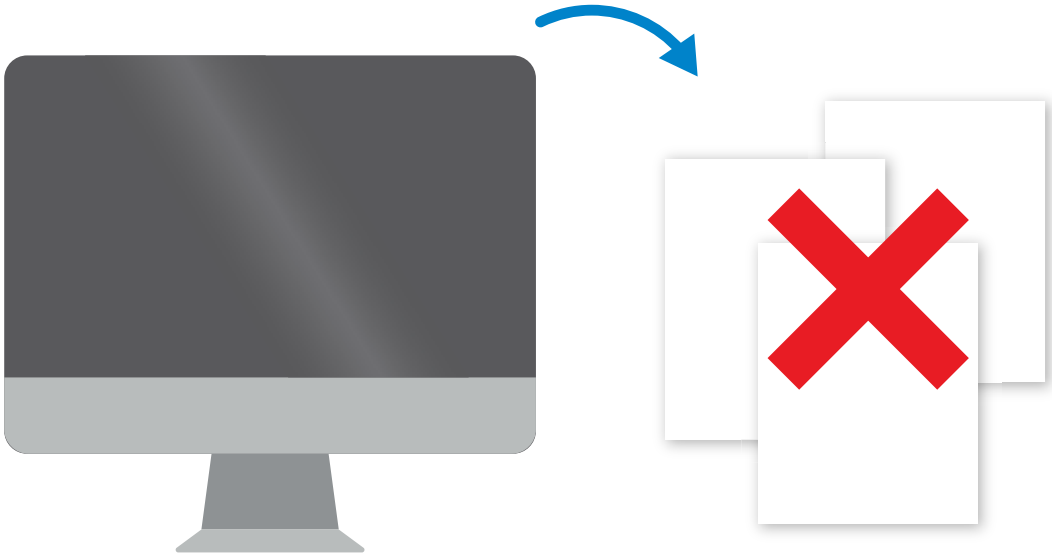
Masterworks has significantly increased efficiency which allows our inspection staff to spend more time performing their core functions of contract compliance verification and quality assurance, and less time doing paperwork, while providing more complete documentation and reducing errors which has increased the speed of business so we can be more responsive to our Contracting Partners.

WHAT'S NEXT:

Additional features and enhancements including Estimating and Bidding and the replacement of the Materials database will be added to MasterWorks in 2018 further improving our way of doing business.

For more information contact Central Construction Group

E-CONSTRUCTION: FULLY ELECTRONIC UDOT CONSTRUCTION PROJECT FILES



THE PROBLEM:

Hard copies of advertising, contract administration and project closeout files for each project added up to additional time to process and sort and to find a place to store them. All of this added process time and physical files equated to inefficiencies in the process and handling of project documents.

THE CHANGE:

The Central Construction group has created an automated workflow along with documentation procedures for project contract documents both inside and outside of MasterWorks. MasterWorks handles the contract administration, estimating and bidding, while the actual generating of the contract remains outside of MasterWorks. The group has gone from chasing documents to reviewing documents. In addition, a number of process inefficiencies were identified and revised during this process, creating a well organized, efficient process that is consistent and easily followed on each project.

THE RESULT:

Automation of a paper process has eliminated redundancies, increased productivity and efficiency, and provided for higher quality in the documents. The automation of change orders and pay estimates has sped up the process meaning the contractors get paid faster. There is also increased transparency for this prompt payment. It has also significantly reduced, and in some cases eliminated the print, sign, scan process where digital signatures were incorporated.

WHAT'S NEXT:

There is only one process left to become fully electronic: the Contractor's need to have one document notarized. Efforts are underway to detail this process and require 100% electronic documentation for construction projects. In addition, this improvement allows for additional staff training to spot and focus on document quality Automation also provides data that can be analyzed versus reacting to need which will be reflected in updated performance measures.

For more information contact Central Construction Group

INNOVATIVE CONTRACTING : DESIGN BUILD

Total Score = Price + Technical

Total Score = Price + Time + MOT Impacts + Risk + Project Benefit

Total Score =

$$\left(\frac{P_L}{P_P}\right) W_{Price} + \left(\frac{T_L}{T_P}\right) W_{Time} + \left(\frac{L_L}{L_P}\right) W_{MOT} + \left(\frac{B_R}{R_P} - 1\right) W_{Risk} + \left(\frac{PB_P}{100}\right) W_{PB}$$

THE PROBLEM:

Design Build selections were based on a adjectival evaluation system that had inherent drawbacks. We found that contractors had limited opportunity to innovate and they were spending a large amount of money on proposals that were primarily being awarded to the lowest bidder.

THE CHANGE:

We looked to other states for examples of how to improve the selection process and an equation was developed that takes time, maintenance of traffic (MOT) impacts, project risk, project benefits (both qualitative and quantitative), and price into account. Each of the categories are weighted and the equation produces a number between 0 and 100 by which the proposals can be ranked.

THE RESULT:

The equation was used in a modified form for the first time in the Technology Corridor Design Build selection. Only price, MOT impacts, and project benefits were used and converted to a dollar amount and selection was based on lowest dollar value. Interestingly, the use of this method is producing a paradigm shift in understanding that the project benefits part of the equation may be zero, and that is okay. In addition to these benefits, a Commitments Table form is produced in the proposal process that outlines the commitments of the contractor which give confidence to the selection and construction team of what will be done and not relying only on the written proposal.

WHAT'S NEXT:

The equation will be used in a more robust format on the I-15 Southbound; SR-201 to 12300 S project. The process will continue to be refined as it is used more in the future to help reduce costs in the proposal phase and deliver better projects in construction.

For more information contact Statewide Innovative Contracting Engineer

COLD IN-PLACE RECYCLING (CIR) LINK

THE PROBLEM:

Cold In-place Recycling (CIR) as outlined in the Special Provision was a proprietary process and failed miserably because the range for acceptance of the oil was so open. The process when, implemented correctly, can be much more cost effective than Hot In-Place Recycling (HIR) and works better for pavement that is structurally sound but in worse surficial condition.

THE CHANGE:

The Central Materials group developed a performance based specification based on successful experiences in surrounding states. The new spec requires adding material to balance the gradation.

THE RESULT:

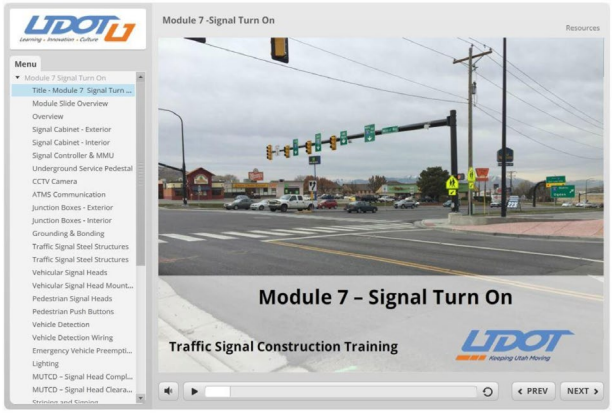
The new spec has allowed for many improvements. The use of CIR saves 30% in cost over reconstruction. Tests have been developed to confidently allow traffic on the pavement section earlier, we are able to reach our targeted air void with more certainty, and the heat curve is more well utilized. Also, there is a better mix design process, and we found that there is a direct correlation between density of the pavement and quality of CIR performance.We now use in field personnel for a owner controlled approach which is not common in construction and we now have a Materials Manual of Instruction for CIR.

WHAT'S NEXT:

The Materials group is continuing to review and refine various parts of the specification especially concerning the emulsion.

For more information contact Central Materials Group

ON-LINE TRAFFIC SIGNAL TRAINING MODULES



- **P** Contractors are required to provide certified field technicians before beginning signal work and it can be time consuming and expensive to obtain this certifications.
- **C** Traffic and Safety created an eight-module course related specifically to UDOT traffic signal construction.
- **R** Traffic and Safety now has a world class signal construction training course that is UDOT specific and can be modified as standards and technology progresses.

For more information contact Central Traffic and Safety

REGION ONE LABORTORY TURN AROUND TIME PERFORMANCE

- **P** UDOT desired to provide improved responsiveness and faster results to their customers when they needed UDOT's laboratory testing.
- **C** UDOT developed an internal sample tracking system to track sample progress to better prioritize their efforts. Real-time reporting was part of the solution
- **R** UDOT was able to reduce their turnaround time for laboratory testing for pavement designs by 38% to keep projects moving through design. (FY 2017 over FY 2016).

For more information contact Region One Materials Engineer

BRIDGE DECK PRESERVATION – POLYESTER CONCRETE OVERLAYS

- **P** Need for bridge deck overlays with high quality and longer life.
- **C** Polyester concrete is being utilized for bridge deck preservation but also for grade corrections.
- **R** A longer life of 25+ years and a seal to the bridge deck that protects the structure greater than before.

For more information contact UDOT Structures Division

10600 SOUTH INTERCHANGE 3-SIDED BOX SLIDE

- **P** Box culvert installation can shut down traffic for extended periods of time.
- **C** 3-sided box culvert was build adjacent to the construction site and slid into place in a very minimal window of time.
- **R** Sliding of the box took less than two hours and traffic was back to normal two days ahead of schedule.

For more information contact Statewide Project Manager, Region Two
LINK: TIME LAPSE: 106TH SOUTH UNDERPASS

INNOVATIVE CONTRACTING: CMGC

P Limited standardization of the price facilitation process for the OPCCs on CMGC. Potential confusion on projects of how the OPCCs would be conducted.

C Implementation of a standardized price facilitation process with the Contractor, EE, and ICE prices coming to a single location for analysis and delivery to the team.

R Fewer misinterpretations and greater transparency. Understanding of the process by new projects utilizing CMGC.

For more information contact Innovative Contracting Engineer

MOBILE BARRIER SYSTEM

The Mobile Barrier Trailer (MBT) is another option for crews to add safety to their operations.

THE PROBLEM:

While working on bridge shoulders or near steep slopes or high barrier, our maintenance and construction personnel often are in harm's way because of the lack of egress. Jumping over the parapet to escape an oncoming vehicle just isn't an option.

Equally infeasible is the problem of providing positive protection for short term work. Placing barrier for such projects isn't financially and logistically feasible. How do we provide a safe working environment for such hazardous conditions?

THE CHANGE:

In the Fall of 2016, UDOT Central Construction took delivery of a MBT that has proven particularly efficient for various types of work where protection has not traditionally been practical and where setup/breakdown has sometimes taken longer than the work itself.

The MBT provides a highly mobile, self-contained, protected work environment for our maintenance and Contractor personnel when working on short duration projects along high speed & and high traffic roadways like I-15 and I-80. The trailer is tested and accepted under NCHRP 350 with interchangeable right and left configurations while providing positive protect in 42-82' lengths. The MBT provides positive protection for our workers in situations where it was previously impractical to provide due to time constraints.

THE RESULT:

Crews now have access to the trailer through Google Calendar or can contact Central Construction to schedule a time to use it. Along with the positive protection, the trailer provides lighting and power, a truck mounted attenuator, and an integrated changeable message sign. The trailer has been used in various locations and is a great option for mobile positive protection while working in hazardous areas for short durations.

WHAT'S NEXT:

The Department is in the second year of a three year lease with an option to buy. UDOT Central Construction continually works on getting the word out and for greater utilization of this great resource.

For more information contact Central Construction Group

PORTABLE HAND WASHER

THE PROBLEM:

Bothwell Maintenance Station personnel in Region One wanted a way that they could remove contaminants from the workers in the field. There are many operations we do where we come in contact with substances we dont want on our skin or even just activities where we get dirty. We would have to wait till we could travel back to the shed or find a public restroom to wash.

THE CHANGE:

We created a portable hand washer by using a water tank and scrap metal from other projects we had done. We have the ability to wash off at the truck as soon as we need to.

THE RESULT:

We have been able to reduce extended exposure to harmful contaminants and there is the added benefit that we can keep the cabs of our vehicles cleaner by washing up before getting in them. The hand washer is in the truck for other operations, and it is surprising how often it gets used. It was built out of scrap materials from other projects. The water tank was $15.00.

WHAT'S NEXT:

We hope that we can continue to improve the washer and that other stations will use and find value in it.

For more information contact Region One North Disctrict Engineer

SHOULDERING CHUTE

THE PROBLEM:

The issue started with shouldering operations and raising of the bed to expel material. We would have to stop and lower the bed when we had to drive under utility lines. This takes time and is not an efficient way to get the work done.

THE CHANGE:

We manufactured a chute that attaches using the same pins as the sander. The chute allows for the material to exit the truck and funnels it to the side of the truck, onto the shoulder of the road. Making the chute runs about $150 with labor and materials and requires no modifications to the truck itself.

THE RESULT:

Using the chute has allowed our shouldering operation to run more efficiently. We can now place the material just where we need it without raising the truck bed. Since we are only placing material where we need it we are no longer wasting material. We are able to shoulder more area with each load of material and we do it with fewer man hours.

WHAT'S NEXT:

We are planning on building more chutes for the rest of our fleet. We have also loaned the chute to our neighboring stations to help with their operations and anticipate that they will continue to request it.

For more information contact Region One Maintenance

FINE GRADED HMA MIX

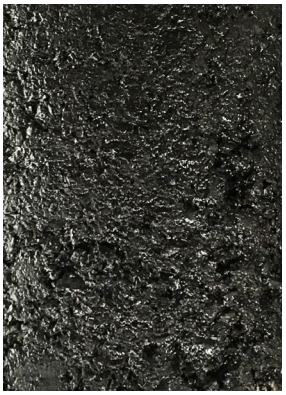
P Using the Superpave mix design methology has led to coarser and drier mixes related to oil content. This has made roadways more susceptible to environmental cracking.

C New specification required a finer gradation which helped increase the amount of oil in the mix. This led to a more flexible end product that is able to withstand environmental distress better. Also reduced the amount of Recycled Asphalt Pavement (RAP) to 15% instead of the usual 25%.

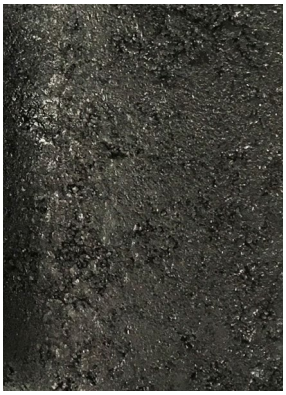
R Current assessments show that the roadways are handling environmental distress much better.

For more information contact Region Materials Engineer Region Two Materials

STANDARD MIX



FINE GRADED SAMPLE



HOT-IN-PLACE RECYCLE HMA

P Section of roadway had rough ride with environmental cracking with primarily chip seals as the preservation treatment method.

C Performed a hot inplace recycle involving heading and scarifying the top 1.5-inches and adding a recycling agent to the mix. Additional 1.5-inches added and a mircrosurface treatement.

R Provided a smooth ride with no cracking.

For more information contact Region Three Pavement Engineer

SNOW PLOW HOSE REPLACEMENT SCHEDULE

P Snow plow hydraulic pumps can run dry and are freezing/burning up due to a loss of hydraulic fluid from hose breakage.

C Improved replacement strategy for hydraulic hoses.

R There is now a pro-active approach instead of a reactive. Less issues during the winter season with plows being out of commission.

For more information contact Area Engineer

BUILDING REPLACEMENT PRIORITIZATION

P Building prioritization was very subjective and caused inconsistencies and ranked newer facilities higher on the list than older ones.

C Expanded criteria adding specific detail and facts while eliminating opinions.

R List was re-prioritized based on new criteria and ordered all stations in a way that made more sense. Newer buildings that were too high on the list moved down while older ones in need of replacement moved up.

For more information contact Land & Building Project Manager

OLD LIST #20 NEW LIST #5

FLEXIBLE DELINEATOR SIGN MOUNTS

P It's difficult to set up Traffic Control on flexible delineators versus the traditional medal mounts. It requires additional Traffic Control equipment be brought to a job site.

C An innovative solution was developed to utilize the flexible delineators by modifying the steel delineators and utlizing temporary pins for easy removal.

R More efficiently placed traffic control with less required resources.

For more information contact Region Four NW District Engineer

SUSTAINABILITY INDEX FOR PAVEMENT MANAGEMENT

P Pavement deterioration has been historically measured with annual distress surveys to collect actual condition data. This looks at the current condition of the system to see how things have been done in the past instead of looking forward.

C Created performance measure to evaluate if planned projects are going to be sufficient to maintain the pavements.

R Reviewed the current 3 year Preservation and Rehabilitation program to verify that sustainability objectives will be met. Once we have current condition data, will be able to analyze if the new process is working.

For more information contact Program Development - Pavement Management

GROUT CURTAIN INSTALLATION

P Settlement of highway due to material washout around pipe could lead to collapse of the culvert and damage to roadway.

C Installation of grout curtain around the pipe filling in the large voids and stabilizing the roadway.

R The grout curtain allowed for the roadway to stay open during the process and mitigated the need to replace the entire culvert.

For more information contact Region Three Design

SMART GROWTH

Smart Growth Workshop addresses UDOT's goals for the Technology Corridor.

THE PROBLEM:

Growth has occurred rapidly in the Lehi area and UDOT is planning to reconstruct the stretch of I-15 between Lehi Main Street and S.R. 92 beginning in 2018. UDOT recognized the impacts the project would have on the interlocal system and wanted to plan a project that would enhance and encourage active transportation long after the project.

THE CHANGE:

UDOT partnered with the Governors' Institute on Community Design to conduct a two day Smart Growth Workshop in October 2016. Stakeholders together identified active transportation options, brainstormed improvements, identified barriers to implementation, and determined agency roles. Ultimately, cost and feasibility would determine which of the options would be developed in final designs.

THE RESULT:

A one-way frontage road system with shared use paths was added to project plans, along with a bridge over I-15 connecting Triumph Boulevard with 2300 West. Providing a safer environment for people walking, biking and taking transit and supporting the area's growth into a vibrant center over time.

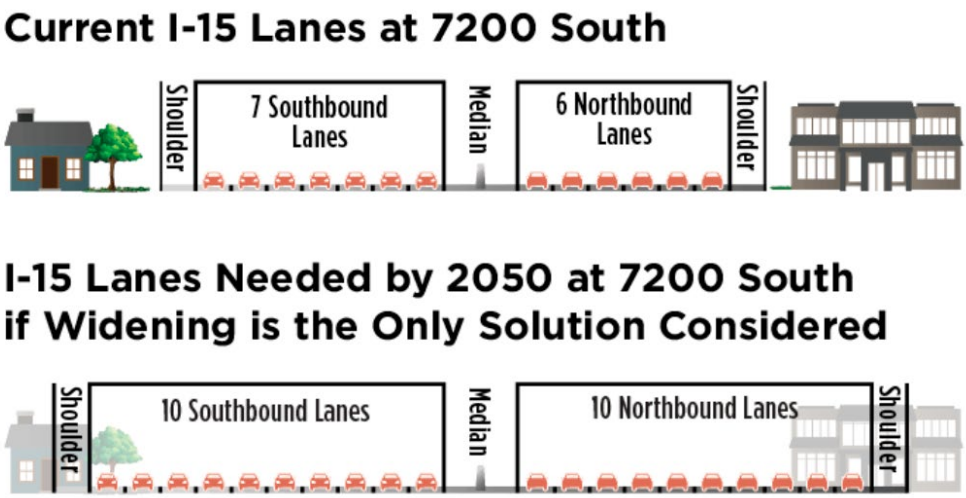
WHAT'S NEXT:

The Technology Corridor project Smart Growth Workshop addressed UDOT's strategic goals to Optimize Mobility and Zero Crashes, Injuries and Fatalities. It is a tool that could be implemented and beneficial on future projects.

For more information contact Region Three Preconstruction

WASATCH FRONT CENTRAL CORRIDOR STUDY

LINK



THE PROBLEM:

Utah's population is anticipated to nearly double between 2010 and 2050, effectively doubling the demands on our road and transit systems. However, while travel demands continue to grow, there is less room to widen roads or add new transportation infrastructure.

THE CHANGE:

The Wasatch Front Central Corridor Study was an interagency, collaborative effort between UDOT, Mountainland Association of Governments, Utah Transit Authority and Wasatch Front Regional Council with the goal of developing a more integrated range of solutions along the I-15/FrontRunner corridor that could serve Utahns through 2050.

THE RESULT:

The study team developed, modeled and evaluated a range of transportation scenarios from which a final "hybrid mobility scenario" was developed, which was a combined set of solutions from the other scenarios. The solutions identified in the study will inform the WFRC and MAG 2019-2050 Regional Transportation Plans and Utah's Unified Transportation Plan.

WHAT'S NEXT:

Integrated solutions the study into various cycles of the WFRC and MAG 2019-2050 Regional Transportation Plans and the Unified Plan; ongoing public involvement.

For more information contact Central Planning Group

INITIAL SCENARIOS
FALL 2015- SPRING 2016
Developed coneceptual scenarios
Stakeholder Workshops

REFINED SCENARIOS
SUMMER- FALL 2016
Analyzed transportation & economic impacts & fiscal sustainability of scenarios
Small-Area Meetings

HYBRID MOBILITY SCENARIO
END OF 2016-EARLY 2017
Identified Hybrid Mobility Scenario
Final Report

REGIONAL TRANSPORTATION PLAN CONSIDERATION
2017-2019 Consider solutions from the study in various cyclesof the WFRC and MAG 2019-2050 RTPs and Utahs Unified Transportation Plan
Ongoing Public Involvement

GENEVA ROAD CORRIDOR AGREEMENT

P Following the closure of the Geneva Steel plant, significant growth in economic development. There was a need to take a long term approach to the corridor to proactively consider the future.

C A corridor agreement included Vineyard, Orem, and UDOT addressing access control/spacing, traffic signal locations (existing and future), and recognizing there will be a raised median included in the future widening project.

R The result was a well-defined Access Management Agreement which includes an Access Management Plan section outlining signalized intersections, non-signalized full movement intersections, right-in and right-out access points, conformance with spacing requirements, existing accesses, and access cross-sections.

For more information contact Region Three Traffic Engineer, Region Three Traffic & Permits

COLLABORATION TO RESTORE SIGNAL SERVICE AFTER CRASH

P A crane truck with an extended boom took out the mast arm wiping off all devices and doing exstensive damage to the structure.

C Significant coordination was undertaken between Saratoga Springes and UDOT. *On-call contractor* CVE quickly removed the mast arm and installed a span wire tethered by two jersey barriers. Central database of traffic signal plans that is searchable and available to everyone.

R The roadway was reopened and the signal reprogrammed to full operation within 8 hours.

For more information contact Signal Engineer UDOT Regions Three & Four

MOBILE DEVICE IMPLEMENTATION E M Q

10 MIN AVERAGE SAVED PER VEHICLE

- **P** Oversized and overweight permits can can take a while to solve issues.
- **C** Streamlined process utilizing a mobile app so drivers do not have to leave their vehicles.
- **R** New process is saving an average of 10 minutes per vehicle for the permiting.

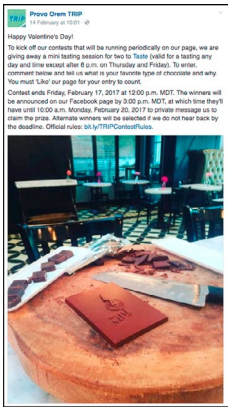
For more information contact Motor Carrier Division

COMBINED PUBLIC MEETINGS E Q

- **P** Due to multiple construction projects taking place at the same time, inviduals would have to attend more than one public meeting to obtain all needed information.
- **C** UDOT held a combined public meeting for two large projects in the area. UDOT also invited the Local Governments to attend and show their projects. This allowed for all of the large local road projects to be represented in one location.
- **R** Combining the meetings allowed the public to attend one meeting and receive information from all of the projects that would impact them. It was similar to what MAG does each year in Utah county, making it more efficient for the citizens.

For more information contact Region Three Project Manager

PROVO OREM TRIP SOCIAL MEDIA AS PART OF CONSTRUCTION BUSINESS MITIGATION PLAN Q M



- **P** The Provo Orem Transportation Improvement Project (TRIP) construction is taking place on key business corridors central to each city's economic vitality.
- **C** Facebook is being utilized to promote businesses throughout the corridor to lessen possible negative impacts to commerce. This included regular communication and updates in additional to specific business promotion.
- **R** Promoted business spotlights and contests reach an average of 20,000 people with a 9 percent engagement rate, compared to 0.1 percent on regular posts.

For more information contact Region Three Communications Manager

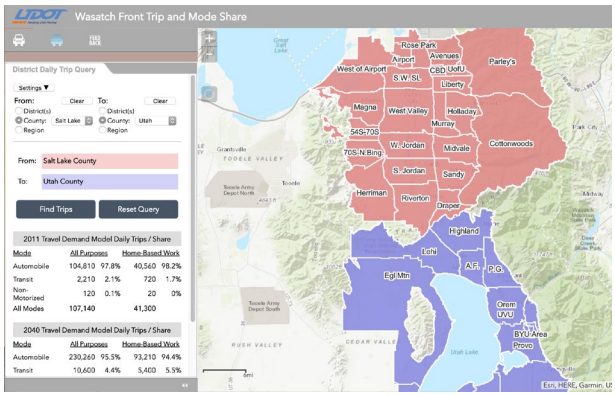
WASATCH FRONT TRIP AND MODE SHARE MAP

P UDOT needed a quick way to respond to questions about mode share. Senior leaders, partially in response to stakeholder inquiries, frequently ask about current and projected mode share along the Wasatch Front.

C UDOT created a tool that displays mode share data from the 2012 Household Survey, 2011 TDM Baseline, and 2040 TDM projections. This tool can show various combination of district, county and region trip mode shares; as well as district specific mode distributions

R A tool that quickly answers questions about current and future mode shares. We also found the tools is useful in trouble shooting travel demand model results. A very cool tool.

For more information contact Program Development Division
LINK: Map



TOLL STATUS INDICATOR LIGHT INSTALLATIONS

P The Transaction Status Indicator (TSI) light installation locations made it difficult for drivers and the Highway Patrol to identify if an Express Lane violation was taking place.

C UDOT put together a plan and a design that will take the signs off the back of the Plaza signs and place them on the median barrier.

R This has increased awareness for UHP and drivers of the status of vehicles traveling in the Express Lanes. Individuals are able to determine if they have a valid current tag. It also encourages individuals to more appropriately utilize the Express Lanes.

For more information contact Electronics Supervisor

ARNOLD INITIATIVE

P FHWA unveiled a new requirement for State Departments of Transportation to implement a GIS-based network that includes the all public roads network and accompanying Linear Referencing System (LRS).

C UDOT Developed new strategies for collecting and managing UDOT's state highway system, local roads networks, and LRS.

R The project was comprised of three tasks including the geospatial data summary assessment for meeting ARNOLD requirements and conducting a local outreach program to establish a data supply chain or local roads information that will satisfy the ARNOLD requirements.

For more information contact Program Development Division

ALL ROAD NETWORK OF LINEAR REFERENCED DATA

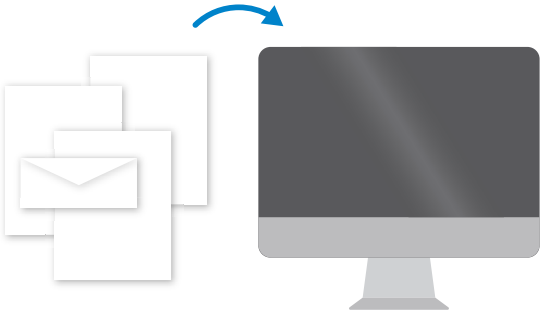
AERONAUTICS GOING PAPERLESS

P Multiple hard copies of state grant agreement documents were being created, mailed back and forth, and filed for each airport project.

C Electronic methods of communication are being used for transferring of data and signature processes in addition of scanning past data.

R The result of this effort is a quicker and less expensive method of processing the state grant agreements and other required documents for airport projects.

For more information contact Aeronautics Division



ADOBE SIGN IMPLEMENTATION FOR UTILITY AGREEMENTS

P Utility Agreements were routinely taking between two and three weeks to gather all of the UDOT signatures.

C Region 4 began using Adobe Sign to gather Utility Agreement Signatures.

R Region 4 is now seeing turn-around times of two to three days for gathering all signatures and having a complete executed agreement in hand.

For more information contact Region 4 Right of Way

ADOBE SIGN ONLINE ROUTING & WORKFLOW IMPLEMENTATION

P Documents were being printed and taken to individuals for signature or forwarded manually through email.

C By integrating AdobeSign into the UDOT environment, individuals were able to generate their own online workflows and route documents to those that needed to interact with or know the documents were processed.

R Faster processing and response times. Also a reduction in clerical activities.

For more information contact Business Information Technology (BIT) Group

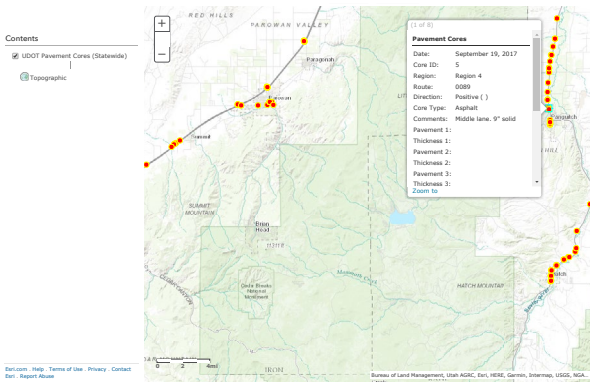
GIS CORE MAP

P Difficult to store and log core photos and conditions data and identify the road in a method that was easy to access and navigate.

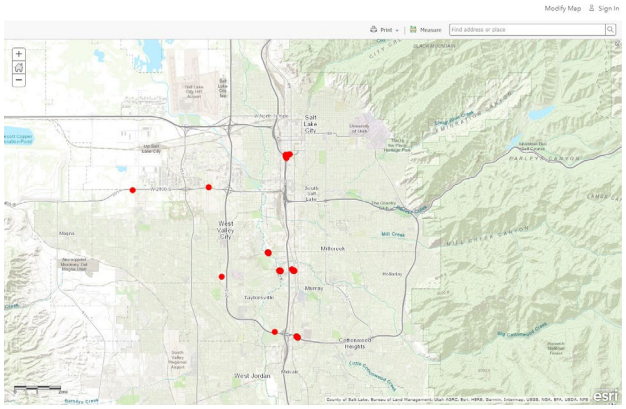
C We created a GIS Uplan map that we can store the core information in at the location and time the core was taken.

R Simple to view a UPlan map to see core locations and the information associated with that core on a specific section of roadway.

For more information contact Asset Management Engineer
LINK: MAP



UDOT HOMELESS CAMP APP



P It was difficult to pinpoint the exact location of homeless camps and the attributes of that location to assist with the cleanup efforts.

C An application was created to provide exact GPS locations from an individual's cell phone. The individual can also add attributes of the location and identify special needs along with attaching pictures. This has assisted with quicker cleanups and better cost allocations.

R This has assisted with quicker cleanups and better cost allocations.

For more information contact Senior GIS Analyst

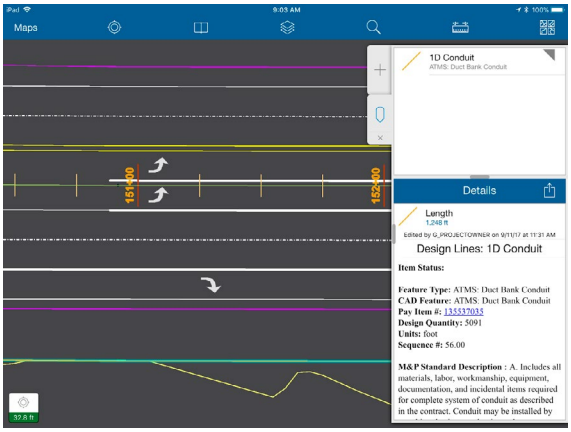
GIS COLLECTOR PILOTS

P Plan Sheets for a project can only convey so much information and they take an immense amount of time to prepare.

C UDOT created a mobile GIS application and FME process for both the I-70 project and the SR-193 project that shows design data that is traditionally conveyed via plan sheets.

R The UDOT inspectors and PM's involved were very impressed with the ability to see interactive design, M&P, A&D, and ROW data on a single application.

For more information contact Central Project Development



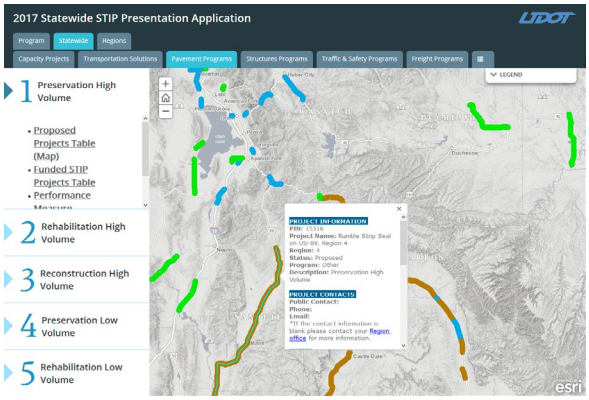
STIP WORKSHOP IMPROVEMENTS

P The challenge was presenting the vast amount of complex information in a way that was simple to follow and understand.

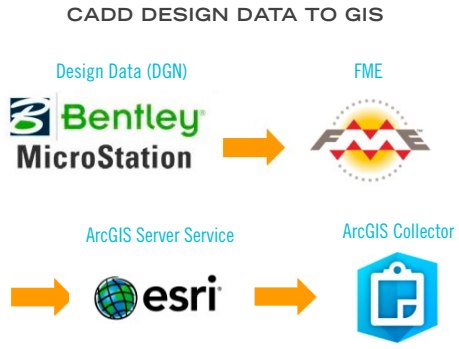
C Over the last two years UDOT has moved from a hard copy STIP workshop publication, to an online workshop publication, to the GIS application implemented last year.

R The results were that the information was in such a format as to provide almost any user an understanding of it

For more information UDOT Program Development
LINK: PROCESS



FME - BREAKING DOWN DATA SILOS TO MAKE GREAT THINGS POSSIBLE



P Connecting to and integrating business systems across UDOT has traditionally been a difficult process. Expanding integration to other systems such as google docs was very cumbersome and involved lots of manual data transferring.

C We Implemented FME (Feature Manipulation Engine) within the GIS group.

R CADD design data can be converted to GIS simply and efficiently using UPlan and mobile devices

For more information contact GIS Program Manager

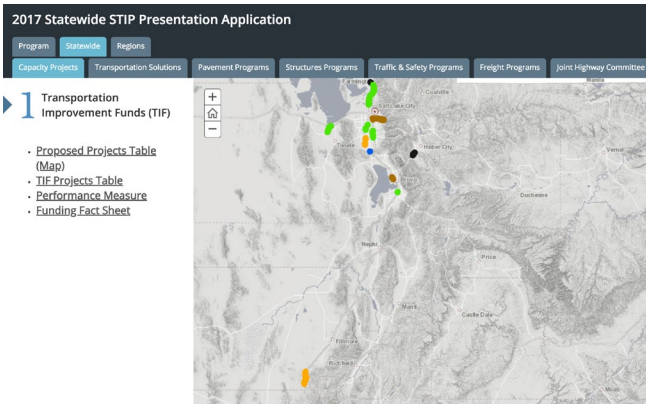
UDOT REGION 1 GIS APP

P GIS layers were found in various locations and were difficult to locate.

C A UDOT Region 1 Application was create to be a one stop shop web application fo view GIS Layers. Layers are categorized in a single location to be quickly turned on/off in a single application.

R Much more simple to find the maps that an individual is looking for and have all the data in one location for simplicity of turning layers on and off.

For more information contact Planning & Technology Engineer Region One
LINK: LINK TO APP



PERFORMANCE MEASURES & DASHBOARD DEVELOPMENT

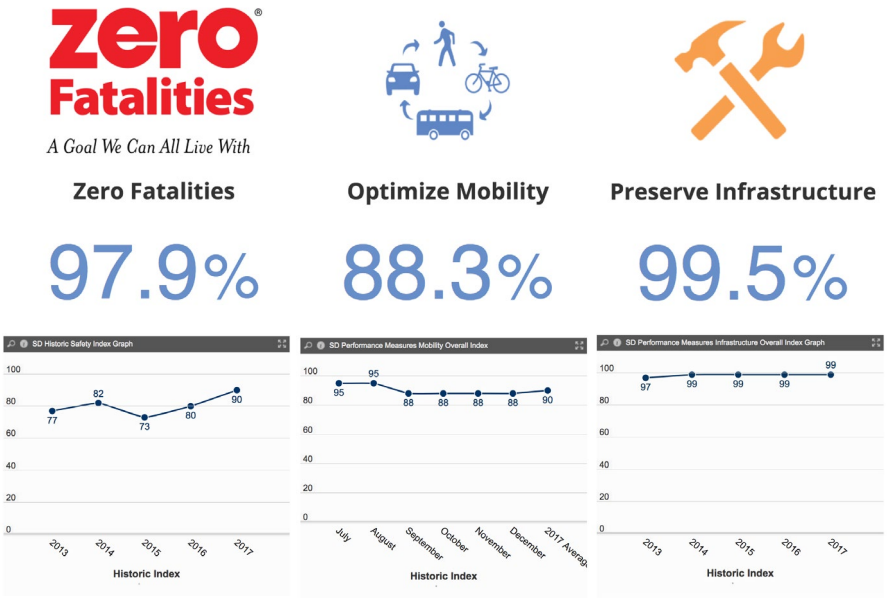
P UDOT's Strategic Direction had minimal measures to determined whether the goals were being achieved and no visible indication of current status.

C The Performance Management Group was established consisting of senior leaders. An active dashboard was developed to indicate current status. Yearly targets were identified and are now being tracked to help guide future decisions.

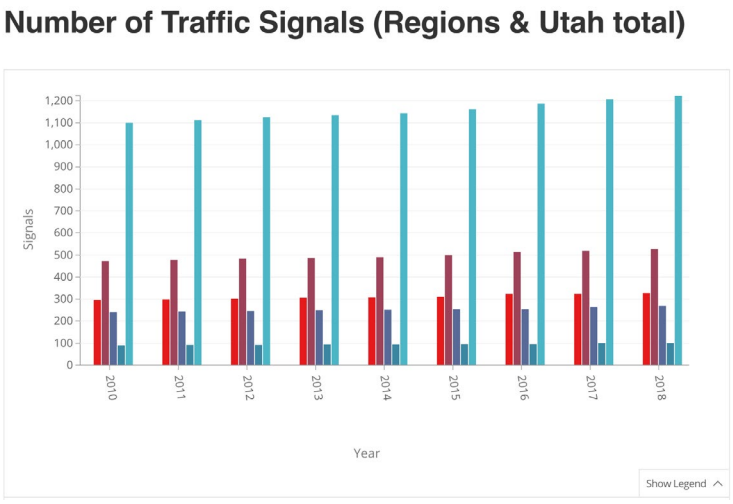
R The result is a dashboard that indicates were we are in meeting our goals and strategies to guide our project selections.

For more information contact Director of Transportation Performance UDOT Program Development

LINK: UDOT'S STRATEGIC DIRECTION



TRAFFIC DATA DASHBOARD IN SOCRATA



P UDOT did not have metrics or a dashboard to visually display critical traffic volume trends.

C Metrics/Dashboard was developed in Socrata. Traffic story site and data lens sites were created to specifically show trends for Vehicles Miles Traveled (VMT) on the State Highway System, which has the largest VMT.

R Now UDOT has a visual display of the traffic volume trends data in Socrata. The traffic story site tells UDOT's story and shows trends in VMTs for 2002-2016.

For more information contact Systems Planning and Programming

LINK: UDOT'S STRATEGIC DIRECTION

SNOW AND ICE PERFORMANCE MEASURE

- **P** Limited information related to how well a region performed during a snow event.
- **C** Updated the Snow and Ice Performance Measure and incorporated RWIS data with an algorithm developed by Central Maintenance / UDOT Weather Group. Have been able to refine the performance measure.
- **R** Ability to better track how Regions are performing during snow events and drill down to where concerns may be.

For more information contact Central Maintenance Planning
LINK: UDOT'S STRATEGIC DIRECTION

FACILITATE & SUPPORT UDOT BIT/SOCRATA DATA ANALYSIS & REPORTING PROJECT

- **P** Inability to quickly retrieve, analyze, and view any/all data so that accurate and immediate decisions can be made.
- **C** UDOT hired Grant Thornton to implement the cloud based server from Socrata to be able to access, analyze, and report on vast amounts of UDOT data for quick consumption.
- **R** The result of the Socrata implementation is a centralized hub where UDOT leaders and employees can utilize and analyze data sets from multiple UDOT systems.

For more information contact Business Information Technology (BIT) Group
LINK: UDOT'S STRATEGIC DIRECTION

CONTINUOUS COUNT STATIONS (CCS) MAINTENANCE PERFORMANCE MEASURES

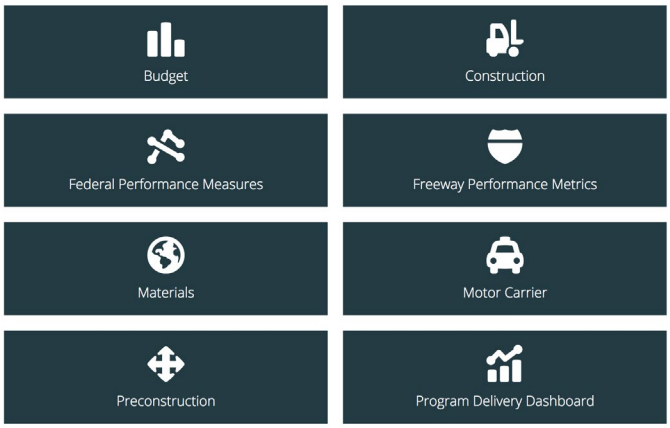
- **P** No formal life-cycle maintenance plan for the Continuous Count Stations (CCS).
- **C** Through coordination with the Traffic Operations Center implemented a life-cycle approach to CCS maintenance. This new approach is needed for the system preservation and will provide system stability and reliability.
- **R** Will ensure that CCS's are in better working order and are repaired in a timely manner.

For more information contact Program Development Division
LINK: UDOT'S STRATEGIC DIRECTION

SOCRATA IS USER FRIENDLY

- **P** Cognos can be confusing and at times difficult to extract the information desired in a usable format.
- **C** Information is being extracted and displayed using Socrata. The application is being used during bi-monthly project manager meetings.
- **R** Socrata allows for real time showing of each of the PMs, how they are performing, and what projects are up and coming. Helps to see areas for improvement. Socrata is much more user friendly than Cognos making it more efficient to get information needed.

For more information Region One Program Manager
LINK: UDOT'S STRATEGIC DIRECTION



UDOT'S LIVE STRATEGIC DIRECTION DOCUMENT

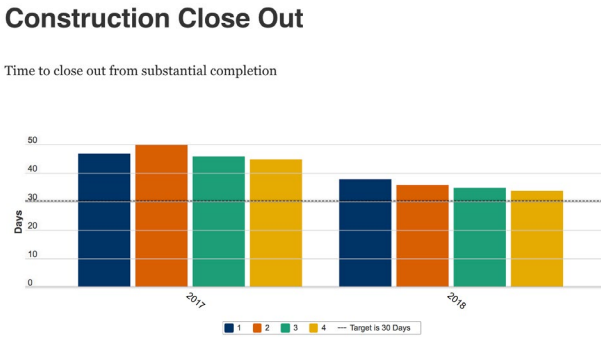
E Q

P At the end of each year, UDOT would chase data in order to provide information to the Strategic Direction Document.

C UDOT connected the data feeds to the Strategic Direction Document with live links so that users can see, up to the date, information about goals and performance.

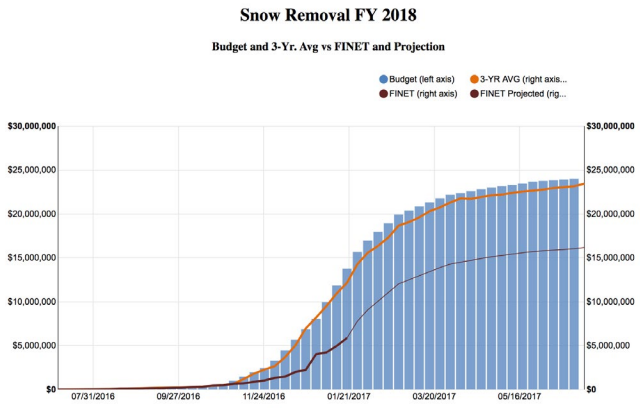
R UDOT now has more timely & useful data for decision-making. Also, UDOT will no longer need to spend several weeks chasing information to update the document.

For more information contact Engineering Technology Services
LINK: UDOT'S STRATEGIC DIRECTION



SNOW MANAGEMENT DASHBOARD

E Q



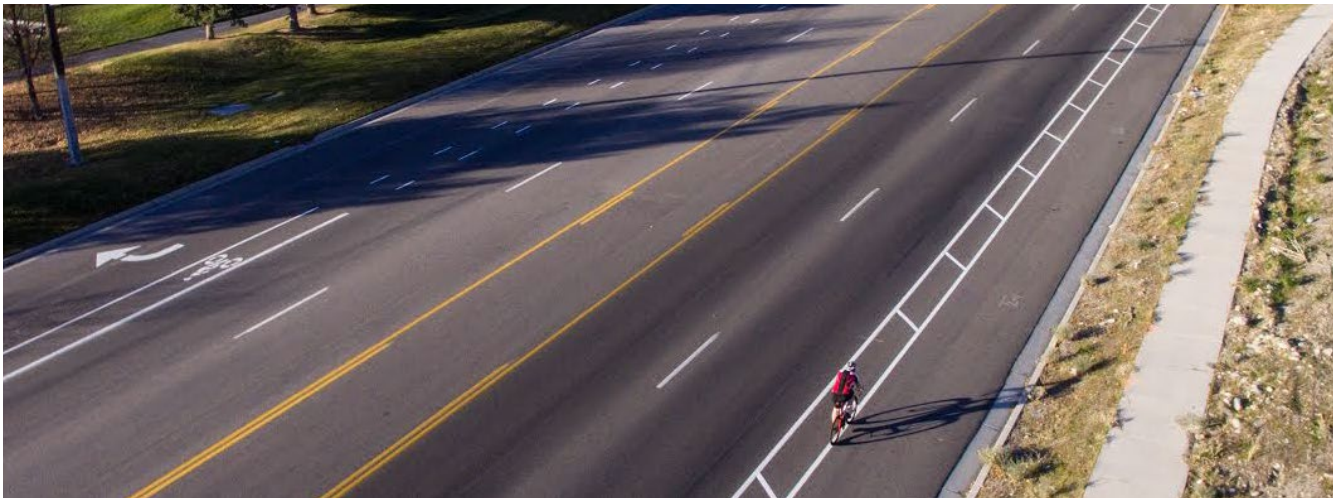
P Data comes in from various locations to assist with managing the snow storms each year which can be difficult and time consuming due to the lack of an organized method of data analysis.

C The Snow Management Dashboard is a real time tool that shows the location of UDOT's snow plows along with the RWIS developed Snow and ICE Performance Metric in a side by side screen.

R The Region Maintenance Stations are now able to make decisions based off real time data.

For more information contact Central Maintenance Planning
LINK: UDOT'S STRATEGIC DIRECTION

BUFFERED BIKE LANES ON UNIVERSITY AVENUE IN PROVO



Buffered bike lanes provide another option to increase safety for bicyclists.

THE PROBLEM:

US-189 is a heavily used corridor by all types of cyclists. This corridor has a paved recreation trail adjacent to it for a portion of the limits of this project. Trail users include a multitude of varying types of user, including slower recreational cyclist, pedestrians, children and pets. This created a safety concern for all users. Strong and confident road cyclists desiring high speeds and commuter cyclists did not want to mix with the other trail users because of the potential of collisions and conflicts. In the locations where there is no trail, sidewalks were the only alternative other than the shoulder of the roadway. UDOT wanted to encourage active transportation by providing a safer, more comfortable experience for those wishing to use the roadway rather than the trail or sidewalk.

THE CHANGE:

Parking was not allowed for most of the corridor before the project so UDOT designated the shoulder as a buffered bicycle lane. In areas where parking was allowed, UDOT partnered with Provo City to remove parking and enforce the new “no parking” zones to allow for the buffered bicycle lanes to be placed. The buffered bike lane has a painted buffer of 3’ or more moving the cyclist further to the right, away from traffic.

The buffered lanes also discourage parking by having continuous pavement markings to alert drivers of the lane. We now have a designated bike lane from BYU to 5200 North in Provo, near the mouth of Provo Canyon, which is a heavily used cycling corridor.

THE RESULT:

These lanes have made things significantly more safe for both trail and road users. The trail users are safer because there is less conflict with faster cyclists, and the road users are safer because they now have more than three feet of separation between user types. The buffered lanes help encourage all road and trail users by allowing cyclists to choose where they believe it to be the safest location to travel. It also encourages adherence to the state law of allowing a cyclist 3’ of space, encourage adherence to the no parking zones, and allows our plow drivers to not have to plow around parked vehicles along the roadway.

WHAT’S NEXT:

We now have an in-place example of successful buffered bike lanes on a state facility. This will help those involved in planning and installing bike lanes on state roads understand the use of buffered bike lanes and how they may be applied to their projects if appropriate.

For more information contact Region Three Project Management Group

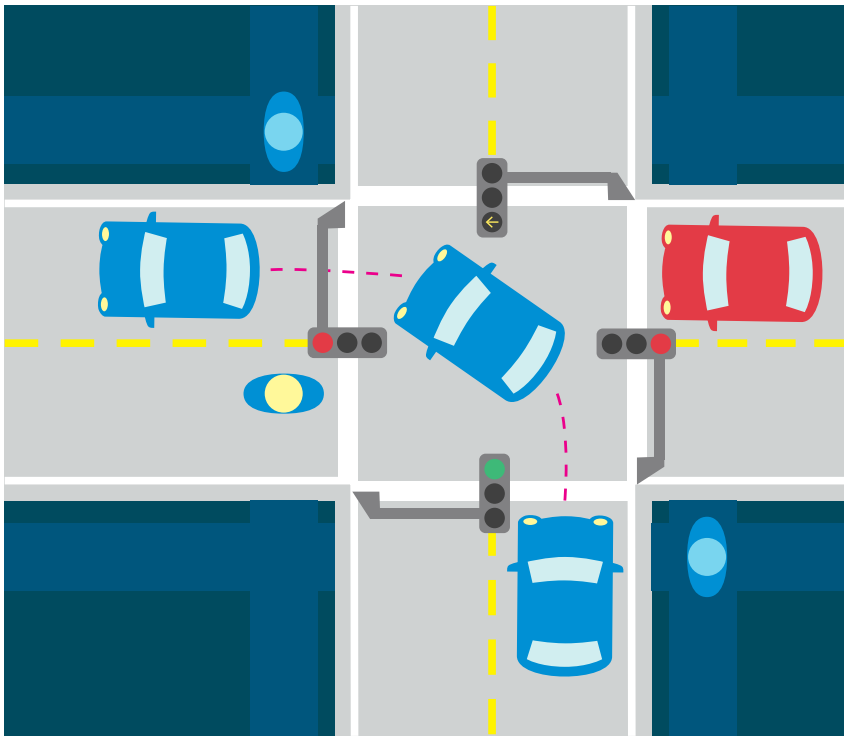
SIGNAL LOGIC TO ENHANCE SCHOOL CROSSWALK SAFETY

P Crossing Guards have the ability to extend crossing times with a keyswitch at specific intersections. A few of these intersections have Flashing Yellow Arrows (FYA) that indicate to drivers that left turns are permissible causinga conflict with crossing pedestrians.

C The Traffic Management Division working with Region 2 developed programming in the controller to omit the FYA when the key switch is activated.

R This programming is part of the new logic capability in our newer traffic signal controllers. This change removes the conflict between left turning vehicles and pedestrians that are using the crosswalk correctly.

For more information contact Traffic Management Division



MOVE UTAH (THE EVOLUTION & REBRANDING OF ROAD RESPECT)

P UDOT desired to take a new approach to the Road Respect program to better each individuals across Utah.

C The Road Respect program was restructured to be Move Utah. This has been a more engaging and proactive process that takes place year round to provide technical expertise.

R A brand new website has been developed for the program; launched in early Winter 2017.

For more information contact Program Development - Planning Division
LINK: MOVE.UTAH.GOV